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All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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G. F. JENKINS,

Minister of Agriculture.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"J. G. S.," Wilmington, has mare with a bladder-like swelling which becomes more pronounced after foaling.

Reply—The mare has an inversion of the bladder, which is not of uncommon occurrence. No veterinary officer is available to visit you, and I would suggest that you make an attempt at reposition of the organ. Obviously the sooner you undertake this the more favorable is the chance of recovery. It will be necessary to administer chloroform, and the bladder should be carefully cleansed and disinfected before reposition is attempted. Probably the doctor who diagnosed the condition would explain the details of the operation.

"H. W. S.," Modbury, reports mare with a slight discharge from one nostril.

Reply—I advise you to continue the use of linseed meal and condition powders. If the discharge becomes worse try inhalations of steam, medicated with friar's balm. Discharge from one nostril often indicates a chronic inflammation of the cavities of the head. If it does not respond to simple remedies it may require surgical treatment.

Hon. Secretary Agricultural Bureau, Lake Wangary, asks particulars of pizzle disease in sheep.

Reply—This disease is known as "balanitis," or inflammation of the sheath. It is most common in Merinos, and the best way to prevent it is to keep the wool clipped round the parts in close woolled sheep. Do not cut off the long hairs growing from the end of the sheath. The best application for the disease is a solution of bluestone, 3ozs. to a gallon of warm water. Apply every few days. In bad cases it is necessary also to slit the sheath along the lower border.

"A. C. W.," Booleroo Centre, has light mare with a swelling of the chest in front of the forelegs.

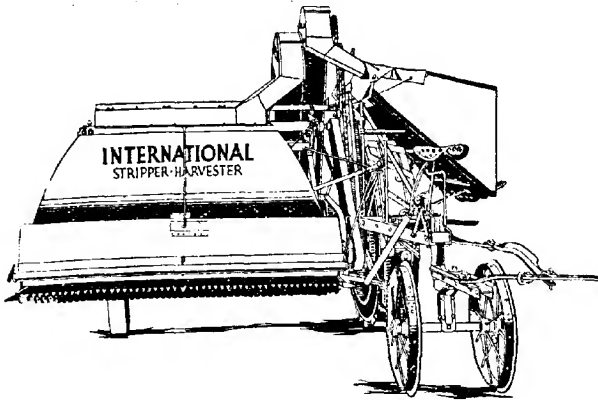
Reply—These swellings are due to any debilitating condition. So long as she has a good appetite and does not show any constitutional disturbance, you need not regard it seriously. Put her on light laxative diet, mashes, and green stuff, and give her saline medicine, such as Epsom salts 1oz., saltpetre one teaspoonful, twice daily in mash or drinking water. Allow her to take a little exercise in a small paddock or yard during the day time.

Secretary Agricultural Bureau, Shoal Bay, submits the following questions:—

(1) Bluestone for stomach worms. Reply—The strength of bluestone solution for stomach worms is 1 per cent, this would be 1lb. bluestone to 3galls. of water. Dose—1½oz. for lambs, 3oz. for sheep. Whether one teaspoonful of Cooper's Powder Dip to a bottle of water is injurious depends upon the size of the bottle. This amount in a pint bottle would not be injurious in the dose you mention.

(2) Whether Cooper's Dip will cure lice in horses. Reply—Yes, but it must not be used any stronger than the usual strength for dipping sheep.

(3) The cause of a four-tooth grass-fed Merino ewe losing its wool. Reply—Any severe disturbance in health, such as fever, may cause a loss of fleece, less serious conditions may cause a "break" in the wool.



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"W. S.," Wudinna, has mare "groggy" in the legs after eating wheat.

Reply—Your mare is suffering from laminitis (founder). You can give her some relief by putting her in a foot bath two or three hours a day. She should stand in cold water up to the fetlocks. If you are unable to provide a foot bath you can apply cold swabs to the feet if they are hot and painful. This disease frequently becomes chronic, and causes more or less structural alterations in the hoof.

"J. T. B.," Gladstone, asks treatment of pigs for intestinal worms.

Reply—Give turpentine in doses of one teaspoonful per 100lbs. live weight, and repeat daily for three days. This is most conveniently given in milk, with which it forms an emulsion. The pigs should be kept without food for at least 12 hours. If many pigs are being treated they should be divided into lots of three or four, so that each will get the proper dose.

"G. B. K.," Yandnarie, has horse with a hard lump on the shoulder at the back of the collar.

Reply—I advise you to apply a little red blister. Clip the hair off the swelling. Rub the blister in for five minutes. Tie him up short for an hour or so after the application. This may cause an abscess to develop. If so, you should evacuate it. Keep the wound clean and dress with disinfectants.

"C. B. B.," Warooka, reports pony with a swelling of the chest and legs.

Reply—I advise you to give him one-half of a level teaspoonful of quinine sulphate twice daily. Mix this in a little treacle and give it on the tongue. Keep him in a clean, loose box or shed. Give him sufficient mash and green stuff to keep his bowels relaxed. Give him also a ½oz. Epsom salts in his drinking water daily. Bathe the part where the swelling has burst with warm water containing a little antiseptic.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR OCTOBER, 1923.

[By C. H. BEAUMONT, Orchard Inspector and Instructor.]

The most important work for the month is the use of the spray pump, with the right solutions, so that the fungus and insect pests may receive a check. Aim at preventing, and there will be less need to try to cure. The weather plays an important part in the development of fungus pests particularly, and thus to some extent controls the use of the pump, and we must be guided by the conditions which prevail. The use of Bordeaux solution before buds burst and occasionally afterwards is the best method of stopping fungus pests from getting a hold on fruit trees and the fruit.

Lime-sulphur solution is very useful; it is a fungicide as well as an insecticide; it is useful to lessen thrip; it is very good against red spider at a time when the mite is getting about; it is also the best

remedy for oidium of the vine and mildew of the strawberry, and it is held by many growers that it is good for aphids on peach and citrus trees as well as woolly aphids. The last-named two, however, are much better dealt with by Black Leaf 40 or similar solutions. Lime-sulphur is used at the rate of 1½ galls. to 100 galls. of water. For codlin moth and other chewing insects there is nothing better than arsenate of lead; with intelligent use, there will be no need to worry about the doings of the neighbors; it will be effective in your garden. For codlin use 1 lb. to 30 galls. of water. For curculio use 1 lb. in 8 galls. of water, and for cut worm the same strength. Pear or cherry slug will be killed by the weaker solution. For borers place in the hole a small plug of cotton wool dipped in petrol and close the hole with clay.

Vignerons should not neglect preparation for downy mildew; Bordeaux mixture is a certain preventive if properly used.

The surface of orchards and vineyards should be kept loose and free from weeds.

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W. & W., 890

METAL GATES AND FENCES

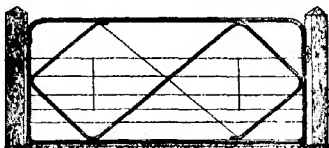


Fig. 201.—Cyclone "Z" Gate.

This is a good horse and cattle gate—strong, but light and well balanced. The strutting of the corners of "Z" gates gives great rigidity, and the welding of the bends and ends to the outer frame is more effective than bolts or clips.

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THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

THIRTY-FOURTH ANNUAL CONGRESS.

The thirty-fourth Annual Congress of the Agricultural Bureau was held in the Victoria Hall, Gawler Place, Adelaide, on September 10th, 11th, and 12th, 1923. During the opening and following session, the officers of the Department of Agriculture and members of the Advisory Board of Agriculture as undermentioned attended:—The Minister of Agriculture (Hon. G. F. Jenkins, M.P.), the Vice-Chairman of the Advisory Board (Capt. S. A. White, C.M.B.O.U.), the Director of Agriculture (Professor Arthur J. Perkins), the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.), the Horticultural Instructor (Mr. Geo. Quinn), the Dairy Expert (Mr. P. H. Suter), the Superintendent of Experimental Works (Mr. W. J. Spafford), the Assistant Dairy Expert (Mr. H. J. Apps), the Wool Instructor of the School of Mines (Mr. A. H. Codrington), the Deputy Horticulturist and Manager of the Berry Orchard (Mr. C. G. Savage), the Manager of the Blackwood Orchard (Mr. R. Fowler), the Manager of the Minnipa Experimental Farm (Mr. R. Hill), the Field Officer (Mr. S. B. Opie), the Experimentalist, R.A.C. (Mr. R. C. Scott), and Col. Rowell, Messrs. A. M. Dawkins, F. Coleman, C. J. Tuckwell (Members of the Advisory Board of Agriculture), and the Secretary (Mr. H. J. Finnis).

DELEGATES.

The following delegates represented the undermentioned Branches: Allandale East—C. Griffin, S. Butler; Amyton—A. Fuller, L. Mills; Arthurlton—S. Willing, T. Howlett; Balaklava—W. McPharlin, D. McArthur; Barmera—E. Farmer, N. McKenzie; Balhannah—H. Boehme, G. Edwards; Beetaloo Valley—J. E. Bird; Belalie North—H. and W. Cummings; Berri—A. Mills, A. Jarvis; Blackheath—H. Paech, E. Pym; Blacksprings—C. Hudd, B. Hienrich; Blackwood—R. Fowler, S. B. Opie; Block E—R. Fisher; Blyth—J. Pratt, W. Ninnes; Booleroo Centre—W. Whibley, I. Michael; Borrika—E. Cowled; Brentwood—R. Farmer, R. Anderson; Brinkley—J. Rust, C. Pearson; Bundaleer Springs—M. Cronin, P. Kerin; Bute—J. Read; Butler—A. Pfitzner, D. Butler; Cadell—A. Tonkin, R. Frankel; Carrow—R. Kemp, H. Byrne; Cherry Gardens—C. Ricks; Clare—J. Seales, Bro. Boehmer; Claypan Bore—J. Gray, A. Bickford; Colton—L. Barnes, F. Lewis; Coomandook—R. Upton, M. Wilkin; Coonalypn—G. Wall, F. Tregenza; Crystal Brook—A. Clarke; Currency Creek—H. Higgins, G. Ritchie; Cygnet River—A. Osterstock, F. Wakelin; Darke's Peak—R. Kobelt; Edillilie—T. Sachs, A. Palm; Elbow Hill—A. Ramsey, S. Wake; Eurelia—C. Stott, W. Canny; Farrell's Flat—H. Thompson, G. Powell; Frances—L. McInnes, W. Montgomery; Gawler River—A. Roediger, T. Rice; Georgetown—W. Haynes, R. Matthews; Geranium—W. Pannell, W. Hughes; Gladstone—L. Sargent, J. Bergin; Glencoe—S. Bonney, A.

on Duve; Glossop—G. Jackson; Goode—S. Folland, C. Linke, A. Moore, W. V. Bond; Halidon—C. Russell, L. Seymour; Hartley—P. Paech, C. Hassam; Hawker—J. Smith, C. Pumpa; Iron Bank—C. and I. Morgan; Kalangadoo—N. McCall, T. Bott; Kangarilla—A. Bottrill, R. Morphet; Keith—H. Nagel, P. Petersen; Ki Ki—O. Blucker, L. Angus; Kilkerran—B. Koch; Kongorong—W. Aslin, F. Perkins; Koonibba—J. Foggo, Rev. Hoff; Koppio—G. and T. Gardner; Kybyolite—E. Staude, S. Billingham; Lake Wangary—W. Sheppard; Puckridge; Lameroo—C. Needs, W. Kriewaldt; Lipson—S. Swaffer, W. Blacker; Lone Gum and Monash—E. Whitelaw, S. Randall; Lone Pine—T. Fromm, H. Kappler; Loxton—S. Fuller, Nettleton; Lucindale—L. McInness, G. Langberg; Lyndoch—J. Hammatt, H. Kennedy; McGillivray—R. Wheaton, E. Seagar; McLachlan—G. Roe—E. Kloppe; Maitland—G. Pearce, P. Bowey; Mallala—J. Catt, W. Earl; Maltee—A. Marchant; Marama—A. Freig, T. Hinkley; Minnipa—J. Head, G. Williams; Meadows—S. Dodd, H. Michelmore; Milang—W. Giles, W. McMillan; Millicent—J. Mullins, D. Hannaford; Monarto South—H. Patterson, M. Thomas; Moonta—A. Ferguson, P. Ford; Moorak—J. Nicholls, H. Tarrant; Moorlands—L. Spurr, V. Piggott; Moorook—S. Perkins, A. Lamant; Morphet Vale—E. Hunt; Mundalla—S. Stoddart; Murray Bridge—A. Potter, E. Neumann; Mount Barker—J. E. Smith; Mount Bryan—J. Simpson, W. Quinn; Mount Bryan East—J. Thomas, Mount Gambier—R. White, D. Collins; Mount Pleasant—C. Royal, J. Miller; Mount Remarkable—W. Bishop, T. Bell; Mount Schank—J. Davidson, J. Doman; Nantawarra—R. Nicholls; Naracoorte—G. Turnbull; Narriby—J. Darley; Narrung—J. Steer; Nelshaby—A. Laurie, F. de Silva; Netherpton—A. Coates, A. McLean; New Residence—A. Ford; North Booborowie—J. Thomas, F. Clark; Nunkeri and Lurgoo—H. Sanders, J. White; O'Loughlin—E. Lutz, A. Kloeden; Ororoo—J. Robertson, H. Matthews; Owen—A. Freebairn, R. Harkness; Parilla—C. Foale, A. Wilden; Parilla Well—E. Slater, A. Kretschmer; Paskeville—R. Cowan, R. Train; Pata—L. Christie; Penola—S. Ockley, W. Clifford; Petina—H. Howard, W. Penna; Pinnaroo—F. Bonnin, H. Davis; Pompoora—J. Bray, A. Lambert; Pygery—D. Smith, E. Edmonds; Port Elliott—W. Green, H. Welch; Ramoo—W. Hunter, J. Odgers; Rapid Bay—A. Bennett; Redhill—I. Crouch, D. Torr; Rendelsham—V. Smith, L. Bradshaw; Riverton—J. McInerney, E. Gray; Riverton Women's—Mesdames T. Longbottom and J. Thomas; Roberts and Verran, F. Masters; Rockwood—E. Heath, H. Henley; Saddleworth—F. Coleman; Saddleworth Women's—Mesdames J. Garrett, A. Baldwin; Salisbury—C. Baker, E. Tate; Sandalwood—J. Mathiessen, D. Thompson; Shoal Bay—A. Nash, G. Barrett; Smoky Bay—F. Gregor; Stockport—R. Whiteaw, D. Stribling; Strathalbyn—G. Sissons, S. Bottrill; Streaky Bay—C. Williams, H. Wharff; Tantanoola—W. Haines, E. Altschwager; Yarcowie—J. Ninnes, O. Davidson; Tarlee—A. Fuller, W. Branson; Patara—A. Milne, C. Wylie; Two Wells—S. Hosgood, S. Wasley; Virginia—W. Lang, W. King; Waikerie—L. Pope, H. Milner; Warowie—W. Sanders, A. Ryan; Watervale—E. Holden; Weavers—A. Piggott, A. Sherriff; Whyte-Yarcowie—S. Hunt, G. McGregor; Wilkawat—A. Ellis; Williamstown—G. Brown, W. Mitchell; Williams

town Women's—Mesdames W. Gower and G. Hammatt; Willowie—A. Bartlett, G. Bull; Wilmington—J. Hannigan, J. Modystach; Windsor—A. Williams; Winkie—H. von Bertouch, A. Ingerson; Wirrabara—E. Pitman, E. Stevens; Wirrilla—J. Jamieson, L. Moore; Wirrulla—F. and H. Doley; Wudinna—F. Johnson, W. Cabot; Wynarka—J. Beck, M. Blacket; Yadnarie—R. Forbes, A. Jericho; Yallunda—R. Newell, E. Butler; Yellanna—G. Proctor, J. Laurence; Younghusband—G. Mann, H. Gowling; Ashbourne—W. Cuming, V. Cox; Myrta—J. Schumacher, B. Jenke; Kalangadoo Women's—Miss E. Hemming, Mrs. R. McDonald; Mannanarie—R. Bretag, J. Symons; Cobbogla—A. Coates, W. Sutton; Pinnaroo Women's—Mesdames A. Jones and W. Muirhead; McLaren Flat—L. Hussey, G. Connor; Light's Pass—W. Boehm, S. Ellis.

Monday Evening.

OPENING CEREMONY—THE GOVERNOR'S ADDRESS.

His Excellency the Governor (Sir G. T. M. Bridges, K.C.M.G., C.B., D.S.O.) said there was no doubt that the Bureau did splendid educational work in collecting and disseminating information, and had greatly assisted the admirable progress made in agriculture in South Australia during the past 30 years. The problems with which they had to deal were many and varied. The experience of the past demanded due recognition of scientific research. He hoped all farmers were aware of the scientific machinery at their disposal, and that they would make use of it, especially in such matters as the early reporting of any new animal or vegetable pests.

THE POSSIBILITIES OF SCIENCE.

If the necessary data could be collected and sufficient time given, there was practically no question, however difficult and complex, to which science could not find the answer. In Australia, a new continent, there was a vast store of learning that was hidden from them and the surface of it had only been scratched. For example, the great boon of superphosphates had been discovered, but who knew of their real action on the soil? It would seem that there was room for a careful soil survey of the whole State, as had been done in most other countries. For that, and other research work, it was to be hoped that the magnificent bequest of the late Mr. Peter Waite would soon be made available. In opening the congress, he felt at a disadvantage to his predecessor in office, who was so well versed in agriculture. His knowledge of the subject that most interested them was of a superficial nature and he came to learn. On the other hand, he had travelled a good deal, with his eyes open, and all over the world he had seen agricultural communities exercised with the same problems as those which confronted them to-day.

AFFORESTATION.

One of the things, he said, that stuck the newcomer to this country was the wholesale way in which it was being shorn of its splendid timber, and the fact that 40 per cent. of the timber used in Australia was imported. He would like to put in a plea for the trees which had

WHAT WAS ACCOMPLISHED

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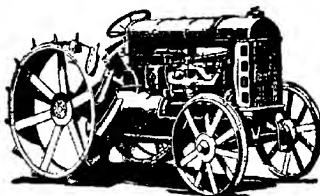
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a high value, not only for timber and fuel and shelter, but for their by-products, and possibly for their influence as forests on the rainfall of the country. In regard to the planting of new trees, he added, there existed an admirable Forestry Department which could supply not only advice, but suitable trees for any plantation.

The farmer of the Canadian and American plains, he continued, working with every modern mechanical assistance; the Moujik of the great south Russian wheat steppes, which poured their produce into the admirably organised and specially constructed port of the Black Sea; the Indians; the patient peasant of Albania, still working within a few hours of Vienna, with his archaic wooden plough drawn by a single ox—all those were concerned as to the price of their products, and the existence of markets.

FALLING PRICES.

The price of wheat, the staff of the world's life, seemed to follow a definite course of fluctuation after upheavals such as had been gone through, and it now appeared to be coming back to its normal level. After a good innings of high prices, the farmer was faced with the necessity of reducing the cost of production, in sympathy with the inevitable fall in prices, and that process was going on all the world over. The energy and resource of the producer, no doubt aided by the activities of the bureau and the march of science, would successfully achieve that result. He was convinced that markets existed for everything that Australia could produce. But they would have to be secured, and sometimes even created. He learned with interest that women's branches of the Agricultural Bureau had been formed.

BOYS' CLUBS.

In that connection he would like to mention that there seemed to be a promising future for boys' agricultural clubs in connection with the Boy Scout movement. Those clubs had had very great success in Canada and America. Their turnover of profits had been phenomenal. The subject would come up for discussion at a meeting at Government House on Friday next. While speaking of that matter, he would like to ask the members of the Agricultural Bureau to help "the Barwell boys" as far as they possibly could, by making due allowance for their different upbringing, and seeing that they had every possible chance not only to work, but to learn to become good farmers and good Australians. He was glad to see the Minister of Agriculture in the chair that night, knowing that he was a practical producer himself, a product of Roseworthy College, and in close touch and sympathy with the difficulties and needs of the primary producer. He (the Governor) could assure them that anything he could do to further the progress of agriculture, or the welfare of the primary producer, would be done. He wished the Bureau all success and prosperity. (Applause).

THE MINISTER'S ADDRESS.

The Hon. G. F. Jenkins, M.P. (Minister of Agriculture), in the course of his remarks, said that he felt very pleased indeed with the seasonal prospects. The outlook had seldom been brighter. Although

portions of the lower and middle north country were not looking too satisfactory, that was more than compensated for by the excellent prospects throughout Eyre's Peninsula and the country east of the Murray. It would not be safe for him to venture an opinion with regard to prices, but he had heard of forward sales of wheat at higher prices than he had anticipated. He trusted they would go still higher.

THE CO-OPERATIVE SPIRIT.

He was pleased to note that the co-operative spirit was strong at the present time among agriculturists. Evidence of that had been given under the administration of the Loans to Producers Act, for it was estimated that by the end of June next, no less than £150,000 would have been loaned to producers. The practice of establishing farmer's plots on private farms in association with local Branches of the Bureau was being continued, and he believed was giving satisfaction. Several Government farms had been placed in typical districts, with the object of stimulating agricultural production. The managers were supposed to keep in active touch with their districts and to afford all assistance and advice within their power. It was believed that they were doing so, and that their efforts were appreciated by their neighbors.

A PROFIT-EARNING VENTURE.

The Turretfield demonstration farm had been run on a purely financial basis since 1921. It was satisfactory to note that after payment to the Government of interest on fixed and floating capital, and £300 towards the manager's salary, the net profits for two seasons aggregated £921, or at the rate of 6s. 7d. per acre per annum on the whole area. The farm accounts were being used with a view to determining as accurately as possible the cost of various operations in farming. Last season it cost £2 to grow and stack a ton of hay, inclusive of all general items of expenditure, and 5s. to grow and store a bushel of wheat.

ROSEWORTHY AND MINNIPA.

A comparison of Roseworthy and Minnipa Farm acreage returns for the years 1915-22, added the Minister, showed—with a total rainfall of 18.21in. at Roseworthy, and 15.34in. at Minnipa—the following:

Crop.	Roseworthy.			Minnipa.		
	T.	c.	lb.	T.	c.	lb.
Hay	2	1	43	1	10	53
	Bush.		lb.	Bush.		lb.
Oats	25		4	29		7
Barley	27		35	16		12
Wheat	18		48	19		18

The average wheat yield at Minnipa, he continued, in 1921-22 from 472 acres was 15bush. 20lb. Booborowie, Minnipa, and Veitch were disposing of the bulk of their grain for seed purposes. The demand for first-class seed grain was far in excess of what the farms were able to supply. It had therefore been decided to limit the quantity supplied to individuals up to February 1st in each year to five bags of any one variety, and not more than 15 bags of different varieties

of the same cereal. After February 1st, if seed grain was still available, larger quantities would be supplied if application were made. At Minnipa the olive groves now covered 50 acres, and it was hoped that in time they would supply both suitable shelter for live stock in the fields and be a source of revenue to the department.

ORCHARD DRAINAGE.

A salt patch had developed gradually on a moderate hill slope of the Berri State Orchard, and last season a complete drainage scheme was laid down. Hitherto the results secured had been highly satisfactory. Between mid-November, 1922, and the end of July, 1923, about 6½ tons of soluble salt were evacuated by the drain pipes. Already neighboring trees were showing improved growth, and it was hoped in a couple of years completely to reclaim four acres which at present were more or less barren.

CROP COMPETITIONS.

After looking thoroughly into the proposal to grant Government assistance with a view to encouraging wheat crop growing competitions, he was convinced that if the agricultural community of South Australia would take the matter up, nothing but good would come of it. The spirit of rivalry that would be engendered must be for the good of the industry generally. A motion had been placed upon the Assembly notice-paper by Mr. Robinson that £500 should be put on the Estimates for that purpose, and doubtless that member would be pleased to know that the Government had taken "the bull by the horns" in the matter.

With the object of encouraging wheat-crop growing competitions in South Australia, the Government was prepared, subject to the fulfilment of the conditions set out below, to grant assistance to Branches of the Agricultural Bureau as follows:—1. To assist in securing suitable judges; 2. To provide a return rail ticket to enable one judge to travel between Adelaide, or his place of residence, and the centre in which the competitions are being held; 3. To make to the Branch or Branches conducting a competition a grant of 10s. for each entry received, provided an amount equivalent to such grant is collected by the Branch or Branches, for use in defraying expenses or providing prizes for such competitions, and provided also that no such grant for any competition shall exceed £5 in any one year.

Branches of the Agricultural Bureau will not be eligible for assistance unless:—

1. Competitions are conducted in such a manner as to be acceptable to the committee appointed to supervise such competitions, and consisting of the Director of Agriculture (*ex officio*), the Superintendent of Experimental Work (Mr. W. J. Spafford), the Deputy Chairman (Mr. W. S. Kelly), and the secretary (Mr. H. J. Finnis) of the Advisory Board of Agriculture; 2. Unless they are prepared to co-operate with neighboring Branches of the Agricultural Bureau, with the object of ensuring that each competition shall cover as wide an area as soil and climatic conditions will allow. The determination of districts will be subject to the approval of the Minister of Agriculture:

3. Unless they enlist the aid and co-operation of any agricultural show or similar societies which may exist in the area represented by the competitions; and 4. Unless they are prepared to conform to the following conditions:—

(a) Each crop entered must be of an area of not fewer than 50 acres. Entries need not necessarily be confined to one variety, but the maximum number of varieties that will be permitted in one entry is three. Each entry must be in one block or paddock. Should, however, a person desirous of submitting a crop for competition not have an area of 50 acres or more in one paddock or block, he may submit as an entry the whole of one paddock or block of wheat, together with an area of one other paddock or block, sufficient to make up the minimum area of 50 acres.

(b) A minimum of eight entries is necessary before any obligation to provide assistance is incurred by the Government.

(c) Wheat crops entered for competitions are to be judged on the following scale of points:—Apparent yield, 60; trueness to type, 10; freedom from disease, 10; freedom from weeds, 15; evenness of crops, 5; total 100.

(d) Each competitor must supply to the judge, before such competitor's crop is judged, a statement setting out:—(1) The area of each variety constituting the entry; (2) the date of seeding; (3) the rate of seeding; and (4) the nature and quantity of any fertilisers used.

OFFICIAL TESTING.

If dairymen wished to improve the natural milking tendency of their herds they must do it by the use of bulls with good milking ancestry. Hence the importance of submitting the dams of all pure-bred milking strains to an official herd testing. The whole matter was being reorganised in South Australia, and it was hoped that in course of time dairymen would be able to insist upon the production of proof that any bull they purchased came from good milking ancestry. At present there were under test 18 pure-bred herds, comprising three Friesians, 12 Jerseys, two Illawarras, and one milking Shorthorn. All officially tested bulls would be eligible for subsidies under the Dairy Improvement Act, 1922. It was intended to hold sales at important country centres wherever sufficient inducement offered. Increase in the mean output per cow meant increased production. Herd testing, by compelling the dairymen to study the output of individual cows and their response of improved feeding methods, and by the healthy rivalry it developed, was an essential aid toward increased production, and for that reason the Government had encouraged the formation of herd-testing societies. Several had been formed, but it was regretted that one had not been established in the north, with Laura as its centre, for it was believed that exceptional results might have been obtained in that district. In the first year of the Mount Gambier Society, Mr. E. W. Tollner secured first prize, with an average of 879.27galls. of milk, and 385.81lbs. of butter fat per cow from a herd of 15 to 16, which was very creditable. (Applause).

At the instance of Capt. S. A. White, seconded by Mr. A. M. Dawkins, a hearty vote of thanks was accorded His Excellency for his opening address.

Tuesday Morning, September 11th.

FARM MANAGEMENT AND EFFICIENCY.

Proceedings were commenced on Tuesday morning with the following paper contributed by Mr. P. H. Jones, of the Pinnaroo Branch:—

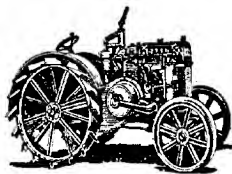
The title of this paper probably suggests to some that the writer—at least in his own opinion concerning the necessary qualifications—would be possessed of unlimited abilities and the embodiment of all those good qualities that go to the making of success. I hasten to correct any such impression that may have become fixed in your mind, and assure you that I approach the subject with a large degree of diffidence. However, I make no apology for being in my present position. The topic is not of my own seeking; it was one suggested, and the request made that I should give expression to my views. It may be advisable, perhaps, to remind you that it has been written, or said, something to the effect that a fool will butt in where the wise make themselves scarce. What I hope to compile will be made up from observation, practical experience, reading, and a little thought. The facts, as voiced, are my beliefs, but the ideas I have may be entirely wrong and I am open to conviction.

The first point is whether any form of business or management is necessary for the efficient working of our farm, or is it sufficient that matters should be free from control? Without hesitation and little fear of contradiction I say yes to the first question. A casual glance at insolvency proceedings serves to confirm this assertion. True it is that misfortune often takes the leading part in ruining one's prospects, but I venture the opinion that by far the greater number of failures in farming practices is due to lack of organisation. As in all other propositions, a farm properly conducted is almost invariably sure to bear satisfactory results. Success does not depend so much on the amount of labor contributed as the manner in which the work is accomplished. In the earlier period of Pinnaroo as a farming district large areas were cropped and highly payable results obtained with but slight attention to cultivation. Who of us would for a moment harbor the thought of seeding similar to the procedure of those early days? Those concerned with agriculture are awakening to the fact that the man of business ability has a long pull over his friends who may be lacking in that respect.

A time there was when it was considered that anyone not possessing the full qualifications as an inmate of a mental home could make good on a farm. That theory has long since been exploded, at any rate, in so far as concerns the general control. It is a freely admitted truth that farming of to-day is not what it was, say, 20 or 25 years back. Certainly science has been a great factor in improving the methods, but were it not for the educational facilities afforded, who of us could grasp the meaning of a lot that has been put in the way of the present day agriculturist. And just here I would pay respect

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to those pioneers of our State. Many there were who could not write their names, and to read was an unknown blessing. There were no experimental stations to guide them, yet by patience, grit, and hard work they plodded along for the benefit of us who were to follow. To what extent is the farmer of to-day availing himself of assistance that was not possible to the early day producer? Given all the advantages of educational facilities and scientific work, has the farmer advanced to that pinnacle that opportunities demand?

An inspection of not necessarily a large area would, I think, be convincing evidence that in business practices he has not kept pace with the times, and this in spite of all I have written that is in his favor. How, then, is the desired improvement to be brought about? To solve the problem I would advocate not quite so much guesswork and subsequent trust in luck, but a more careful and systematic process in all our operations. The many loose methods of the producer would not be tolerated by a commercial house of any standing; there nothing is left to haphazard methods. As an example, take the merchant when he sells you an article. You are asked to sign a sale note, but to any who have taken the care to make known the terms of the sale it is clearly apparent that he (the seller) takes no chance.

It must be readily admitted that the duties of a farmer are most complicated. He cannot employ various assistants who are experts in their own line, as is the case with the mercantile firm. The responsibility of finances, markets, correspondence, and general control of the various farm operations falls to the one individual. Climatic conditions, market fluctuations, our old enemy "Take-all," and various other drawbacks offer quite sufficient I should think by way of speculation, for after all said and done our task is practically a gamble.

If we are agreed that to be methodical is one of the pointers to prosperity, let us consider for a while just how far we fall short in our object. I do not desire to be presumptuous, but perhaps you will permit of my outlining a few of the main factors (in my opinion) essential to general farming pursuits. It may be a case of "Don't do as I do, do as I tell you." The district in which I am working having proved itself most adaptable to mixed farming—I refer mainly to cereals and wool, and do not lose sight of the fact that there are other side lines which can be, and are, turned to profitable account—I would emphasise the advisability of not having all your eggs in the one basket. Likewise, too, it is not wisdom to have too many baskets to be filled, as some may possibly, to a disadvantage, be neglected for the benefit of others. Grain growing and wool and sheep raising can to advantage be worked together, and neither govern the other in so far as control of prices is concerned.

BOOK-KEEPING.

To know whether the farmer is working at a profit, or otherwise, he must be aware of his financial outlay, and, if this expenditure is not returning a reasonable rate of interest, he is forced to the conclusion that his venture is not a prosperous one. He must, therefore, devise a means whereby the state of his finances is clearly defined.

In many instances—I might almost add in most cases—the farmer's set of books is formed with a cheque book and bank pass book. These volumes should contain most valuable information, but at the best divulge nothing beyond actual cash transactions by way of earnings and disbursements. Every farmer should have some more detailed form of book-keeping. Even had I the ability to deal with this item on a strict accountancy principle I realise the impossibility of it being carried to effect. Few of us on the land have the inclination, much less the time, to devote to such a complete system. But I do think that we should have a cash book, journal, and ledger. By this means we could have a true and detailed record of all transactions. Do not trust to memory, because if your mental carrying capacity is not above the average you stand a good chance of slipping, besides it is not method. Keep a rough book and make a note therein, and this can be entered in its proper place as time permits.

At the end of every 12 months a balance-sheet should be prepared, setting forth all earnings and expenses, either cash or credit, together with a list of all stock, *i.e.*, livestock, machinery, harness, and the sundry other items on hand, such as hay, grain, &c. By some such procedure as that which I have outlined one can at a glance take in his actual position. It is a good plan to make the financial year end so as to coincide with the taxation returns. Make all payments by cheque. This does not necessarily signify that each individual account is met with a separate cheque. When there are several small accounts, group them together, taking care to include full details in cheque book heel. All receipts should be paid to the bank. The process of paying one's various liabilities from money received for settlement of an account, besides being far from correct, is liable to lead to confusion. If these two forerunning hints are enforced and a daily record retained of business transactions on credit, then to keep an account of the year's finances is but a simple matter. Make out all cheques to the order of payee, and preferably cross them with the words "Not negotiable." This precaution minimises the risk should a cheque go astray.

If you are so fortunate as to be in that happy position, do not run a huge credit with your banking institution. The money lying idle there should be converted to some revenue producing source. To the man who thinks and keeps well in touch with current happenings it is advisable rather to have an overdraft, for those who properly conduct their business can almost invariably secure a better return for their money than is charged by banks as interest. Do not misunderstand me, for I realise that to be carrying a heavy mortgage is no pleasant position, and for the one so placed it means an uphill battle.

HORSES.

For the time being horse flesh is the main means of locomotion on the farm, and I admit the probability of the tractor in the near future being found suitable for many operations. It is well to get the fact firmly established in your mind that it costs no more to keep a good horse than it does to sustain an inferior one. Has it ever dawned on you what is the additional upkeep and loss of time consequent upon

having, say, 10 horses to do the work of eight? There is the extra feed consumed, additional harness, and extra labor in grooming and yoking. Just here let me make myself clearly understood. I am no advocate of the common practice of expecting eight horses to accomplish that which is the work of 10. If there were less in the way of overweighting the team and more attention paid to proper feeding, grooming, and fitting of collars, I am convinced that that almost sickening sight of sore shoulders would be considerably reduced. Feed your horses regularly four times a day and give just that quantity which they will consume in the one meal. If you want a scratching area for your fowls, do not let that place be the manger. I have more than a hazy idea that fowl dung is no more palatable to the horse than it is to the human.

MACHINERY.

This brings us to one of the heaviest items of expense on a farm, for one must keep abreast of the times. It does not pay to be using a 6ft. machine where one of 8ft. can be satisfactorily worked. Two additional feet in a round at harvest time is a lot. I am not going to further weary you by quoting figures, so work it out for yourself and see the saving. Many years ago, in discussing Bureau work with a former Secretary of the Advisory Board, I quite agreed with him when he said that in arranging a syllabus there were many vastly more important topics than to tell each other of the need to paint machinery. I then held the opinion, and still retain it, that paint is put on wood for a purpose, and the good it serves is not solely to add to the appearance of the implement. A casual glance at the attention paid to machinery on many holdings fills one with amazement at the idea of such valuable property being neglected to the extent that it is. Not every farmer is so fortunate as to have ample shed room, but if you go into the question it will be found that the erection of a brush shed is not a very costly affair. Such a building is not without its faults, but, as the seafaring man says, "Any port in a storm." It is a good plan during the working of an implement to make a note—not only a mental one—of any repairs which may be necessary, and see to it that these defects are remedied before next season. A job in the shop is worth two in the paddock. Another good point to be remembered is that lubrication is usually cheaper than new parts. Do not wait until the need for oil to a bearing is made audible. Be cautious in your purchase of new machinery. Many farmers have the habit of buying an implement solely on the merits of its maker, and, as a consequence, are often left with an implement, which is quite unsuited to local requirements. If you have the inclination to second-hand machinery—I have not as a rule—then be doubly cautious. The purchase of this class of implement has often been the cause of many regrets. When the other chap has something in this line to quit you can depend on it that he has some reason for effecting its disposal, so be most careful in your examination, and so minimise the risk of losing a lot of time, labor, and cash in remedying faulty parts.

INSURANCE.

It is surprising to learn the number of farmers who incur quite unnecessary risks. More than once I have been told that they act as their own insurance company. Such a procedure may not be bereft of good points, but I question its wisdom and venture the opinion that it is a wise man who allows some company, formed for the purpose, to accept the responsibility. By all means, with the aid of firebreaks, etc., guard against the risk of a fire, but do not overlook the possibility of a conflagration starting within those boundaries. For my way of thinking the practice of smoking in paddocks of ripe wheat and stubble is far too common. No, if betting were legal, I would be prepared to wager that I get as much comfort from my pipe as the other fellow, but I hate the thought of the possibility of burning out my neighbors.

PLANNING SHEDS.

The matter of arranging the position of various outbuildings is one which calls for deep thought. Not so very long ago I saw a publication—I forget the article—which set forth a plan of the sheds practically all under the one roof. This idea has the advantage of being less costly, and no doubt is convenient for general working purposes. I wonder if those who advocate such a building have considered the possible and probable result should a fire break out in that shed.

CULTIVATION.

Due respect must be paid to proper cultivation, &c., but as this is a subject sufficiently important for a paper to itself I purposely refrain from making a lengthy comment, and content myself by saying that this operation is most important if we are hopeful of success. Look well ahead, do not wait till it is time for the ploughs to be at work before you decide where you will fallow, and because a paddock is handy to the homestead is no reason why it should be continually under crop.

OVERSTOCKING.

It seems to be quite a common practice to make use of the feed in spring time, while there is abundance, with little thought for autumn provision. I know the temptation to have a large wool clip, especially so in these times of high prices. But I would far rather have a paddock of feed to spare and learn later that it would not be required than to be faced with a need of it and not have it. It is no mistaken policy to keep on hand a supply of fodder to last over a long period. At least a quantity to carry over 12 months ahead should always be in store, and for preference I would have sufficient for two years. It certainly seems a lot of money to remain idle, but, as I have previously mentioned, farming, to a large extent, is a gamble, so why take unlimited risks? We have had droughts, and there is no justification for the thought that they will not again appear. To purchase fodder in such times would absorb an amount far in excess of what you would be losing in interest on the valuation of a haystack or two.

TIME.

Try and realise that your time is valuable; far too costly to be wasted at such periods as seeding and harvest operations. I do not suggest that one must necessarily rise early and retire late. When once a job is started make every effort to get it finished before starting another. To say nothing of the confusion, there is much lost time when there are several works in hand at once. If there are sheep to be crutched see to it that it is performed before you start your harvester, and do not leave the drill idle while you return a borrowed boar. If such things must be done in the busy period get somebody else to do it, not the man on the machine. Keep an eye on those round about you if they are making a success; follow their lead or try and go one better. Friendly rivalry is a great stimulant to improvement. A man can become very narrow in his views by confining himself solely to his own doings. Because our ancestors performed work in a particular way is no argument that the method is beyond improvement.

LABOR.

If you are the employer of labor treat your hired men with respect and in such a way as would suggest that you recognise them to be of a making similar to yourself. Do not encourage too much familiarity, as you thus displace your position as ruler. See to it that he adapts himself to your methods. Because Mr. So-and-So, for whom he last worked, had a particular way of doing certain jobs is not to say that it should be performed in a like manner on your farm.

If this ordeal has not been too wearying I have transported your thoughts across a wide area, and maybe I have wandered from the beaten track. If I have failed to keep up the standard of literary efforts, I trust that some of the points raised will be the cause of an interesting discussion. In conclusion, I would add that as a means of advancing our position as an agricultural calling, adopt a system, be progressive, be cautious, and above all be straightforward in your dealings.

DISCUSSION.

Mr. J. Hannigan (Wilmington) said he would like to lay emphasis on the necessity for insurance, and quoted instances where failure to insure resulted in serious losses. Mr. L. Hussey (McLaren Flat) agreed with the views of the writer regarding the feeding of stock. Horses needed regular feeding with good clean feed. Poultry, he thought, were a great asset on the farm, but they should not be allowed access to the stable. Mr. J. Davidson (Mt. Schank), said a careful account of all the operations connected with the farm should be kept. Leaving the machinery out in the weather would do more damage to it than several seasons work. Some of the principles advocated by the writer of the paper would not be applicable to the lower south-eastern portion of the State. Mr. A. Anderson (Morphett Vale) was in favor of keeping only the best type of horse which should be well fed and cared for. Also, a careful record of all the farming operations was essential. Mr.

T. Gardner (Koppio) referred to the necessity for preserving fodder for lean years. He thought farmers should consider the wisdom of storing surplus fodder as ensilage, because haystacks deteriorated through weather and mice. Mr. G. C. Jackson (Glossop) stated they were often unable to obtain veterinary assistance other than through the Government, and they frequently had to pay exorbitant prices for drugs, &c. He suggested that the Advisory Board should obtain the drugs at wholesale rates, for the Agricultural Bureau Branches. Mrs. Hammatt (Williamstown) said that a covering of wire-netting could be placed over the manger to keep out the fowls, or another method was to use nosebags on the horses.

THE RAISING OF FAT LAMBS FROM MERINO AND MERINO-LONGWOOL EWES.

Mr. R. C. Scott, (Experimentalist), Roseworthy Agricultural College, then read the following paper on this subject:—

Lamb raising is a separate branch of the sheep industry which comes well within the reach of the average farmer. Owing to the steady rise in land values it is evident that the times are past when South Australian farmers could confine themselves exclusively to the raising of grain. This, together with the price of lamb to-day, makes the industry worthy of the most serious consideration. In support of the proposition we have the fact that the raising of a lamb which matures rapidly and whose body attains the desired weight and primeness before weaning, is eminently suited to the majority of our wheat growing areas with their relatively short period of succulent pasture and with fallowing operations steadily reducing the available grazing fields.

Further, sheep on a farm not only act directly as a source of revenue but indirectly also, to the extent that they assist ordinary farming operations by enriching the land with their droppings, thus maintaining the soil in the highest state of fertility; keep down undesirable weeds and compact land that is at all loose and open. On the whole it is in those districts in which wheat growing can be most profitably carried out that lamb raising is most practicable, yet distance from the railway and transport difficulties generally, are factors which have to be considered. As we shall see later on, lambs very quickly decrease in weight and lose their bloom when separated from their mothers, and it is therefore obvious that for best results slaughtering should take place without delay. This fact contributes considerably to the good general appearance of New Zealand export lambs. There depots are generally within handy reach and the lambs may be slaughtered within a few hours of leaving their mothers.

FARMERS' FLOCKS INCREASING.

That the farmers of this State are not altogether unaware of the possibilities of sheep on the farm may be noted from the following table of South Australian statistics.

TABLE I.—*Showing the number of flocks and sheep held in flocks of under 500 sheep, comparatively with those held in flocks of under 1,000.*

Year.	FLOCKS.		Under 1,000.	
	Under 500.			
	No. Flocks.	Per Cent. to Total.	No. Flocks.	Per Cent. to Total.
1917-18	6,886	74.64	8,174	88.60
1918-19	7,268	74.04	8,723	88.86
1919-20	7,790	78.18	8,983	90.15
1920-21	7,772	76.95	9,060	89.70

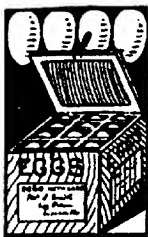
Year.	SHEEP.		In Flocks of Under 500.	
	In Flocks of Under 500.			
	No.	Per Cent. to Total.	No.	Per Cent. to Total.
1917-18	1,273,876	20.45	2,176,756	34.94
1918-19	1,398,885	21.11	2,408,173	36.34
1919-20	1,356,954	22.56	2,188,498	36.39
1920-21	1,303,465	20.49	2,221,008	34.92

Assuming that the average farmer's flock consists of under 500 sheep then these figures indicate that there has been a steady increase in the number of farmer sheep holders up to 1920 with a slight decrease the following year. Approximately 20 per cent. of the sheep in the State are held in flocks of under 500 and 35 per cent. in flocks of under 1,000. A fair estimate seems to be that about a third of the total sheep in South Australia are held by farmers and that about nine-tenths of the sheep owners combine both cropping and grazing. Therefore there is abundant scope for the fat lamb industry which is most successful on comparatively small areas where the flocks may be kept under constant observation. We may now proceed to discuss the advantages and disadvantages associated with the raising of fat lambs.

MARKETING FACILITIES.

In the first place we have to consider the facilities for marketing the produce. Some localities are so far distant from the saleyards at the Metropolitan Abattoirs or the Government Produce Depot that the lambs consigned to them have to spend considerable time in transit and therefore come before the buyers wasted and lacking in bloom. In consequence sellers are compelled to accept reduced values. In such districts the lack of facilities for marketing lambs in a fresh state compels the farmer to regard the wool yield of the ewe as being, at any rate, of equal importance to the revenue derived from the lamb. For those who are within a reasonable distance of meat works, however, the lamb will always constitute the chief source of profit.

EGGS NOW—BUT WHAT ABOUT NEXT WINTER?



Next Winter is the time in which you should bend every effort to make your Poultry Keeping venture successful. Eggs will be

scarce, prices will be high, and though you might think your profits satisfactory now, they will be quickly swallowed up in a few weeks if you are forced to feed hens which will not lay. By commencing to feed your birds on 'KARSWOOD' Poultry Spice NOW, you enrich the blood, tone up the system, and put each one in the vigorous, energetic health, that will enable them to come quickly through a thorough moult and on to lay again when eggs are scarce in other poultry yards. *There's* your profit. Read this letter, typical of hundreds such, and decide to start to-morrow.

"Rockford Road,
Tahmoor, N.S.W.,
January 9th, 1922.

Dear Sir—I hope I shall now be able to forward more consignments, as I find 'KARSWOOD' Poultry Spice assists the fowls through their moult, and brings them on laying much quicker. I am sorry I was short of this Spice last month, but hope to keep it up to them in future.

(Signed) C. E. CARTER."

Mr. Carter but voices the experience of half a million other users. You, too, can have these good results.

NOTE THE ECONOMY. One tablespoonful (½ oz.) of 'KARSWOOD' POULTRY SPICE

(Containing Ground Insects)

Is sufficient for 20 hens for one day; so that it costs you less than a ½d. a day for every 12 birds.

1s. packet (½lb.) supplies 20 hens 16 days.
2s. packet (1lb.) supplies 20 hens 32 days.
13s. tin (7lbs.) supplies 140 hens 32 days.
14lbs. tins, 25s. 28lbs. tins, 46s.

Makes 12 Hens Lay for ½d. a Day.

MAKE A TEST.

Get a 1s. packet of 'KARSWOOD' Poultry Spice from your local storekeeper, grocer, or produce dealer, try it for a fortnight on half a dozen hens. Do not expect immediate results. 'KARSWOOD' works NATURALLY, it does not force, it takes a fortnight or three weeks to show results, but they are good and sure. If your local dealer cannot supply you, drop a postcard either to the agents for your State (address below) or to 'KARSWOOD,' Box 2138, G.P.O., Sydney, and you will be put in touch with your nearest suppliers.

SOUTH AUSTRALIAN AGENTS—

**S. C. EYLES & CO.,
CURRIE ST., ADELAIDE.**

NOTE—If supplied by Wholesale Agents direct, postage must be added to cost.

FENCING AND FEEDING.

Fencing is an important item. When sheep are confined to small fields even the merino is likely to creep through at certain times of the year and the flock becomes a constant source of danger to crops unless sound sheep-proof fences have been erected. Adequate water supplies are necessary and shelter of some kind in bleak fields is a decided advantage to lambing flocks.

Finally, the farmer who wishes to stock up to his fullest capacity must be prepared to handfeed and raise such fodder crops as can be grown in his district in order to carry the flock through a dry period.

THE COLLEGE FLOCK.

Bearing upon the carrying capacity of a wheat raising farm, where due care is taken in the management of the lamb breeding flock, the following data obtained on the College farm may be of interest.

TABLE II.—*Showing the number of sheep kept on the College Farm between 1912 and 1922 and their relation to the arable and grazing area of the farm.*

Season.	Arable and Grazing Area.	Area under Cereals and Bare Fallow.	Average No. of Sheep kept throughout the Year.	Average No. of Sheep kept throughout the Year per Acre of Arable and Grazing Area.
	Acres.	Acres.		
1912-13	1,755	1,335	1,254	0.71
1913-14	1,760	1,220	1,226	0.70
1914-15	1,760	1,353	924	0.52
1915-16	1,760	1,332.5	731	0.54
1916-17	1,760	1,141.3	928	0.53
1917-18	1,760	1,115.4	1,001	0.57
1918-19	1,760	1,190.4	1,092	0.63
1919-20	2,096	1,421.7	1,230	0.59
1920-21	1,909	1,327.7	1,126	0.59
1921-22	1,909	1,324	1,149	0.60
Mean for 10 years	1,823	1,276	1,066	0.60

From this table it is to be noted that the sheep carrying capacity of the College farm is three-fifths of a sheep per acre over the whole area.

During the four or five months of the year when the ewe is suckling her lamb the flock practically doubles itself and corresponding with the decline in the amount of natural feed it sinks again as the lambs are disposed of. As has already been referred to, this condition of affairs fits in well with ordinary tillage operations, particularly in our lower northern areas. Now-a-days no difficulty is likely to arise with regard to the disposal of lambs for their value is to a certain extent governed by the markets of the world. In South Australia the lamb market has to cater for both the local and export trade with the result that early spring lamb usually commands prices much above export rates, but during the flush of the season prices approximate to overseas values. However Abattoirs' prices, now that the export trade

has become fairly established, are less liable to serious fluctuations, and is is recorded that the average price per head for lamb in that market during the last six seasons is represented by the sum of 25s. 4d. Generally speaking, the bulk of the export lambs of this State are sold in the open market and purchased under the hammer by meat exporting firms. This is, however, not the only means open to the farmer for the disposal of his lambs, for he also has the option of forwarding direct to the Government Produce Depot. The following information has been received from that department, setting out the conditions under which they treat for export and sell lambs direct from producers.

SALE ON CONSIGNMENT.

The Department will pay on producer's account:—(1) Railage to works, also order trucks; (2) Slaughtering and freezing charges, 1d. per lb.; (3) Freight to England, 1½d. per lb.; (4) London charges approximately ¾d. per lb. This is equivalent to an over-all charge of 3¼d. per lb.

The Department financially assists producers by making them an advance in cash, less the over-all charges above referred to, of 75 per cent. of the London value at the time of shipment, which is later deducted from their account sales. This advance is free of interest.

As an example—If the London market was quoted at the time of shipment at 9d. per lb. for Australian lamb the producer would actually receive in cash immediately:—

75 per cent. of 9d. per lb.—6¾d. per lb.
Less over-all charges paid—3¼d. per lb.
Cash advance—3½d. per lb.

Assuming an average weight of 33lbs. per lamb the cash received immediately by the producer would be:—

33 lbs. at 3½d. per lb.—9s. 7d.
Value of skins (say)—3s. 11d.
Total—13s. 6d.

The skins are delivered to whatever agent the owner stipulates and the agent pays the owner direct. When the lambs are sold in London and the account sales are received, a copy of same is forwarded to the owner, together with a cheque for the balance of the proceeds. To cover the cost of this work, including the selling commission in London, 4 per cent. commission is charged by the Department. The London market prefers lambs of from 30lbs. to 37lbs. dressed weight.

It may not be generally known in connection with this system of marketing that the vendor of even small consignments reaps the benefits that accrue from a proper system of grading since all the lambs slaughtered on consignment are classified into the various grades whilst on the hook and shipped accordingly.

THE BEST CROSS.

In setting out to raise fat lambs the first question to decide is, what is the best cross to adopt in order to secure early maturity and the aptitude to fatten at a given weight. This latter point is important, as

prime lambs, not too heavy, are the best suited to the export trade. Opinions vary considerably as to which breed or cross best fulfils these conditions, and it was with the object of supplying reliable information on the subject that experiments in connection with fat lamb breeding were instituted at Roseworthy Agricultural College by the Principal (Mr. W. J. Colebatch, B.Sc., Agric., M.R.C.V.S.). The writer has been associated with him in this work and in submitting the results so far obtained wishes it to be clearly understood that the experiment is still in its infancy. The results quoted represent at the most but three years' work, and therefore cannot yet be regarded as conclusive.

At the outset the test was confined to half-bred longwool ewes, but this year has been extended to embrace the Merino. The choice of half-bred ewe lay between the half-bred longwool and the half-bred shortwool, and as the fleece of the latter is short, light, and less valuable, the former cross was adopted. Four strains were secured by mating the Merino ewe with the longwool sires common in South Australia, namely Lincoln, English Leicester, Border Leicester and Romney Marsh. The Lincoln and Romney Marsh Merino ewes have been bred on the farm from large-framed strong constitutioned Merino ewes by good flock rams obtained from the Lincoln stud of Mr. W. Grundy, and the Romney Marsh studs of Messrs. Feuerherdt Bros. and Davidson Bros. Until this season the English Leicester and Border Leicester Merino ewes were secured in annual drafts from Mr. W. S. Kelly and Mr. O. S. Roberts respectively, but in the future all the half-bred mothers will be bred on the farm.

Since 1921 these strains of half-breds have each been mated with Dorset Horn, Shropshire, and South Down rams which are the Down sires commonly used in South Australia, noted for their early maturing qualities, shape of carcass, and prolificacy. Under this plan of mating twelve types of crossbred lambs were obtained. This season the Merino ewe has been brought under test and has been mated with the four longwool rams and the three Down rams above referred to. Thus at the present time nineteen breeds of lambs are being subjected to trial under conditions as near equal as possible.

THE EWES.

In connection with the choice of ewe, speaking generally, South Australia is not in a position to adopt the half-bred altogether, as in the first place that class of sheep is difficult to purchase; and secondly, the average farm fence is not good enough to hold her. There can be no question that cross-bred ewes are better mothers and rear their lambs well, but at the present time the choice of Merino ewe is more or less obligatory. Big framed northern Merino ewes are practically always obtainable, and although the object is to raise an export lamb, yet the wool of the ewe is of importance. In this connection sight should not be lost of the fact that when the ewe has to suckle a strong rapid growing lamb she is not likely to produce the same quality fleece as when rearing the slower-growing Merino lamb. Additional weight of fleece can be expected from the half-bred longwool ewe and although the price of wool fluctuates the total value rarely attains to that of the Merino. The Merino being a smaller framed sheep, eats

less than the crossbred, and in consequence a greater number of sheep per acre could probably be carried, although it is generally conceded that the crossbred is a better forager, not so particular as to quality and recovers more quickly after a hard time.

As the Merino ewe has but recently been admitted to the experiment the relative merits of the Merino and half-bred ewe have not been investigated for sufficient length of time to warrant the expression of confirmed opinions based on experimental data. It remains to be seen in later years whether the advantages of the Merino above enumerated are sufficiently weighty to make up for the extra clip of wool, better mothering qualities, higher lambing percentage, greater value of the lamb combined with the additional price that the half-bred longwool ewe is likely to bring in the market after her days in the lamb breeding flock are finished.

THE SIRES.

Of the sires that are available we have the two classes, namely, longwools and shortwools. In this State the former are represented by Lincoln, English Leicester, Border Leicester, and Romney Marsh, and the latter by Dorset Horn, Shropshire, and South Down. The shortwools are also known as Downs, and to that section may be added the Suffolk and Hampshire Downs, which, although not common with us, are very popular in some parts of the world, and no doubt will eventually be tested in Australia. The Lincoln is probably the most popular of the English breeds of sheep. It is the largest sheep of its class and cuts the heaviest fleece.

The English Leicester is noted for symmetry of form and evenness of carcass. The Border Leicester is one of the most popular of the British longwools possessing particularly good loin and forequarters. The Romney Marsh is an extremely hardy sheep famed for its resistance to diseases of low-lying country. The Dorset Horn is a shortwool breed of growing popularity which imparts very early maturing qualities to its lambs. The Shropshire is noted for early maturity and symmetry of body. The South Down is the oldest of the British breeds and holds the premier position amongst all breeds for quality lamb and mutton. Of the other Downs occasionally met with the Suffolk resembles the South Down in many respects, but is larger and proportionately longer in the leg. The sires are extremely vigorous. The Hampshire is a clean dark faced sheep with strong roman nose; larger, stronger boned, and coarser sheep than Shropshire. The half-bred ewes being used in the test resemble one another in that they possess big frames and strong constitutions. Some of the most typical characteristics are:—The Lincoln ram on the Merino ewe gives a large sheep, even in outline, bluish face, carrying a small topknot of wool. The English Leicester-Merino is rather smaller than the others, being shorter bodied but having square well rounded quarters. The face is bluish and the wool finer than the Lincoln.

The Border Leicester-Merino carries the finest type of fleece; is a large sheep, with long broad back, deep well-sprung ribs and good loin. Perhaps the most typical characteristic is the tendency towards a long Roman nose whitish in color. The Romney Marsh-Merino is a

comparatively loosely built sheep, being wide on the loins, with high, rather narrow forequarters. The bone is coarse, the face short and broad, and the fleece approaching that of the Border Leicester in quality. The Merino ewes comprise a fairly uniform flock built up by purchases from "The Gums," "Koonoona," and "Neath Vale" Stations, together with a few bred on the place, of Canowie strain.

MATING.

In connection with the general handling of the flock, all ewes have been regularly joined with the rams during the last week of November. They remain with them practically two months, being withdrawn towards the end of February. Rather more than 2 per cent. of rams are used, whilst an extra sire is usually added during the last two or three weeks. Restriction in the number of sires is false economy in a fat lamb breeding flock. During lambing time the ewes are visited at least once a day and the lambs tailed with the searing-iron when about three weeks old. However, this depends on the weather, for a bright sunny day is preferred for the operation. After tailing, the various flocks are grouped according to the mother of the lamb. Thus we have five main flocks which are frequently moved from one field to another in order to even up the feed conditions as far as possible.

In computing the age of the lamb it has been decided that May 11th. is a fair basis for commencement, as although the first lambs appear towards the end of April, the greater number are dropped during May. Thus at the time of the first weighing after tailing (August 4th) the lambs are regarded as being twelve weeks of age. At birth the average lamb from a Merino ewe weighs about 7lbs. whilst that from a cross-bred ewe weighs about 8lbs. These weights have been deducted from the totals when averaging the increase in weight per day over the life of the lamb. No concentrated food is fed to them and they simply graze at large on natural pastures.

TABLE III.—*Showing the average weights and daily increases, of lambs obtained from Merino ewes, season 1923.*

Lamb.		Weight when Tailed. Lbs.	Weight at 12 Weeks. Lbs.	Increase per Day. Lbs.	Weight at 14 Weeks. Lbs.	Increase per Day. Lbs.	Average Increase per Day. Lbs.
Long Wool Halfbred.							
Sire.	Dam.						
Lincoln	Merino ..	26.01	46.25	0.42	52.46	0.44	0.46
English Leicester	Merino ..	17.44	47.09	0.45	54.47	0.53	0.49
Border Leicester	Merino ..	19.71	40.63	0.35	46.91	0.45	0.41
Romney Marsh	Merino ..	19.78	46.70	0.40	53.21	0.47	0.47
Means	20.74	45.13	0.41	51.76	0.47	0.46
Short Wool Halfbred.							
Sire.	Dam.						
Dorset Horn	Merino ..	22.52	51.27	0.48	61.61	0.67	0.56
Shropshire	Merino ..	24.08	56.08	0.53	64.38	0.59	0.58
South Down	Merino ..	13.17	47.27	0.57	55.73	0.60	0.50
Means	19.92	51.54	0.53	60.57	0.62	0.55

These figures represent but the result of one year's work and therefore are by no means conclusive. It will be contrary to other experiments of this nature if in future years we do not find the Border Leicester half-bred occupying a higher position amongst the longwools. Both this cross and the lambs by South Down were dropped relatively late in the season and have not been able to regain that handicap.

The following points are of interest:—The lambs sired by the mutton breeds (the shortwools) have matured much more rapidly, showing a greater increase in weight per day than those sired by the longwools, even the slowest maturing, the South Down, being ahead of any of the half-bred longwool lambs. The half-bred English Leicester lamb has shown the greatest weight and increase per day in its class, whilst the Shropshire is at present ahead of the Dorset Horn. However, during the fortnight between the 12th and the 14th week, the latter were increasing at the rate of .67lbs. per day, as against .59lbs. for the former. It would appear, therefore, as if the Dorset Horn will later on outrival the Shropshire.

THE HALF-BRED LONGWOOL-MERINO EWE.

TABLE IV.—*Showing the Average Fleece obtained from Half-bred Longwool-Merino Ewes comparatively with that obtained from the Merino, 1920-22.*

Year.	Lincoln-Merino.	English Leicester-Merino.	Border Leicester-Merino.	Romney Marsh-Merino.	Merino.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1920	9.42	8.89	9.48	8.84	9.69
1921	12.53	11.45	11.80	11.11	9.81
1922	12.70	10.86	10.67	11.47	12.60
Means	11.50	10.40	10.65	10.47	10.70

From the half-bred longwools the highest average weight of fleece has been obtained from the Lincoln-Merino ewe, followed by the Border Leicester-Merino, while the Romney Marsh and English Leicester-Merino are approximately equal. At 1921 shearing the Merino average was materially assisted by weighty fleeces from four-tooth Koonoona and Neath Vale ewes, with the result that the general average was raised, and is now ahead of all except the Lincoln-Merino. In our district we are liable to suffer reduction in wool values owing to foreign matter such as sand and burr; moreover the fibre is apt to be strong, and is sometimes lacking in the lustre characteristics of the wool of cooler districts.

The following table gives some idea of the lambing percentages to be expected under average conditions.

TABLE V.—*Showing Lambing Percentages from Half-bred Longwool-Merino Ewes by Down Rams. Seasons 1921-1923.*

Ewe.	Year.	Ram.			Means.
		Dorset Horn.	Shropshire.	South Down.	
		Per cent.	Per cent.	Per cent.	Per cent.
Lincoln-Merino	1921 . .	93.18	83.72	79.07	85.32
	1922 . .	80.00	82.98	100.00	87.66
	1923 . .	90.63	74.20	103.27	89.37
	Means . .	87.94	80.30	94.11	87.45

age of 12 weeks. When 14 weeks old there are almost always some lambs of marketable weight, and the disposal of these as they mature must inevitably affect the average of later weighings. For that reason the average weights of lambs can only be shown up to the fourteenth week. To obtain the average increase in weight per day, as shown in the last column, a sum of 8lbs. has been deducted from the total weight as representing the average weight of the lamb at birth.

TABLE VI.—*Showing the Average weight at tailing, 12 weeks and 14 weeks, and average Increase in Weight per Day of Lambs obtained from Half-bred Longwool-Merino Ewes by Down Rams, Season 1921-1923.*

<i>Lambs by Dorset Horns—</i>					
Dam.	Year.	Weight at Tailing.	12 Weeks.	14 Weeks.	Average Increase per Day.
		Lbs.	Lbs.	Lbs.	Lbs.
Lincoln-Merino	1921 ..	—	59.57	68.20	0.61
	1922 ..	28.43	70.22	76.17	0.70
	1923 ..	24.77	66.10	76.82	0.70
	Means ..	26.60	65.36	73.73	0.67
English Leicester-Merino	1921 ..	—	63.48	72.09	0.65
	1922 ..	19.38	61.22	69.93	0.63
	1923 ..	21.65	57.51	64.35	0.59
	Means ..	20.51	60.74	68.79	0.62
Border Leicester-Merino	1921 ..	—	75.50	84.30	0.78
	1922 ..	23.00	65.00	72.87	0.66
	1923 ..	23.37	66.47	76.34	0.70
	Means ..	23.19	68.99	77.83	0.71
Romney Marsh-Merino	1921 ..	—	62.93	70.72	0.64
	1922 ..	25.37	57.19	63.26	0.56
	1923 ..	23.46	59.22	65.15	0.58
	Means ..	24.42	59.78	66.38	0.59
<i>Lambs by Shropshire:—</i>					
Lincoln-Merino	1921 ..	—	54.25	60.42	0.53
	1922 ..	23.24	61.32	68.54	0.62
	1923 ..	19.04	59.81	68.91	0.62
	Means ..	21.14	58.46	65.96	0.59
English Leicester-Merino	1921 ..	—	49.61	57.09	0.50
	1922 ..	17.60	54.41	62.97	0.56
	1923 ..	19.04	54.82	61.14	0.54
	Means ..	18.32	52.95	60.40	0.53
Border Leicester-Merino	1921 ..	—	56.14	64.64	0.58
	1922 ..	21.51	61.00	69.42	0.63
	1923 ..	22.72	61.97	68.50	0.62
	Means ..	22.12	59.70	67.52	0.61

TABLE VI.—*continued*

Date.	Year.	Weight at Tailing. Lbs.	12 Weeks. Lbs.	14 Weeks. Lbs.	Average Increase per Day. Lbs.
Romney Marsh-Merino	1921 ..	—	57.70	64.30	0.57
	1922 ..	21.61	55.19	62.48	0.56
	1923 ..	23.43	59.73	65.22	0.58
	Means ..	22.52	57.54	64.00	0.57
	<i>Lambs by South Downs—</i>				
Lincoln-Merino	1921 ..	—	47.97	54.76	0.48
	1922 ..	18.45	54.41	61.21	0.54
	1923 ..	16.66	51.50	60.69	0.54
	Means ..	17.56	51.29	58.89	0.52
English Leicester-Merino	1921 ..	—	47.37	54.41	0.48
	1922 ..	15.30	48.33	56.73	0.50
	1923 ..	24.41	46.81	54.15	0.47
	Means ..	19.86	47.50	55.10	0.48
Border Leicester-Merino	1921 ..	—	54.79	62.12	0.55
	1922 ..	21.23	52.32	60.78	0.54
	1923 ..	22.07	52.74	60.16	0.53
	Means ..	21.65	53.28	61.02	0.54
Romney Marsh-Merino	1921 ..	—	44.40	52.62	0.46
	1922 ..	19.19	53.31	59.51	0.53
	1923 ..	21.20	45.37	51.11	0.41
	Means ..	20.20	47.69	54.41	0.47

Unfortunately, at the commencement of the test the weight of lambs at tailing was omitted. At the end of the fourteenth week the highest average weight was secured from the lambs out of the Border Leicester-Merino ewes by Dorset Horn rams. Of the other lambs sired by Dorset Horn, those from Lincoln-Merino ewes come next in order of merit, and are followed by those from Romney and English Leicester-Merino ewes. The same order in regard to ewes bred to Shropshire rams has been observed. In the case of the South Down lambs, the progeny from English Merfino are slightly weightier than those from Romney Marsh-Merino ewes. On the ordinary farm, higher average weights would probably be obtained, as the yarding and weighing, which these tests entail, tend to check their development.

TABLE VII.—*Showing the Influence of the Sire on the Early Maturity of Lambs from Half-bred Longwool-Merino Ewes, Seasons 1921-1923.*

Age at Weighing.	Average Weight of Lambs by—		
	Dorset Horn.	Shropshire.	South Down.
	Lbs.	Lbs.	Lbs.
Tailing	23.68	21.03	19.82
12 weeks	63.72	57.16	49.94
14 weeks	71.69	64.47	57.36

The extent to which each sire promotes early maturity on the lamb is clearly shown; the Dorset Horn lambs to the extent of approximately 7½lbs. above the Shropshire and 14½lbs. above those by South Down when 14 weeks of age.

TABLE VIII.—*Showing the Influence of Dam on the Early Maturity of Lambs Sired by Down Rams, Seasons 1921-1923.*

Age at Weighing.	Average Weight of Lambs from—			
	Lincoln-Merino.	English Leicester-Merino.	Border Leicester-Merino.	Romney Marsh-Merino.
	Lbs.	Lbs.	Lbs.	Lbs.
Tailing	21.77	19.56	22.32	21.71
12 weeks	58.37	53.73	60.66	55.00
14 weeks	66.19	61.43	68.70	61.80

In this table it is shown that the Border Leicester-Merino ewe influences early maturity to the extent of about 2½lbs. over the Lincoln-Merino and 7lbs. over both the Romney Marsh and English Leicester-Merino.

INCREASE IN WEIGHT OF LAMBS.

The question as to when the lamb increases in weight at the greatest rate is more or less influenced by the season, for it is more likely to mature faster in warm, sunny weather than under cold, wintry conditions. Further, the time of the year at which the forage attains the feeding value essential for rapid flesh production varies with the season. Thus considerable fluctuations occur as to rate of maturity.

TABLE IX.—*Showing the Average Daily Increase in Weight of Lambs by Down Rams from Half-bred Longwool-Merino Ewes, Seasons 1921, 1922, and part 1923.*

Period.	Lambs by Dorset Horn Rams.			
	Lincoln-Merino.	English Leicester-Merino.	Border Leicester-Merino.	Romney Marsh-Merino.
	Increase per Day.	Increase per Day.	Increase per Day.	Increase per Day.
	Lbs.	Lbs.	Lbs.	Lbs.
Tailing to 12 weeks	0.52	0.54	0.61	0.45
12 to 14 weeks	0.60	0.58	0.63	0.47
14 to 16 weeks	0.81	0.80	0.84	0.73
16 to 18 weeks	0.57	0.49	0.57	0.47
18 to 20 weeks	0.39	0.31	0.44	0.39
Means	0.58	0.54	0.62	0.50
Period.	By Shropshire Rams.			
	Lincoln-Merino.	English Leicester-Merino.	Border Leicester-Merino.	Romney Marsh-Merino.
	Increase per Day.	Increase per Day.	Increase per Day.	Increase per Day.
	Lbs.	Lbs.	Lbs.	Lbs.
Tailing to 12 weeks	0.51	0.43	0.48	0.44
12 to 14 weeks	0.54	0.53	0.56	0.46
14 to 16 weeks	0.77	0.66	0.81	0.72
16 to 18 weeks	0.51	0.49	0.55	0.54
18 to 20 weeks	0.40	0.44	0.36	0.35
Means	0.54	0.51	0.55	0.50
Period.	By South Down Rams.			
	Lincoln-Merino.	English Leicester-Merino.	Border Leicester-Merino.	Romney Marsh-Merino.
	Increase per Day.	Increase per Day.	Increase per Day.	Increase per Day.
	Lbs.	Lbs.	Lbs.	Lbs.
Tailing to 12 weeks	0.42	0.34	0.42	0.31
12 to 14 weeks	0.54	0.54	0.55	0.48
14 to 16 weeks	0.75	0.64	0.80	0.67
16 to 18 weeks	0.50	0.51	0.58	0.48
18 to 20 weeks	0.36	0.43	0.30	0.34
Means	0.51	0.49	0.53	0.46

The daily increase in weight of all breeds steadily rises up to the fourteenth to sixteenth week, when the maximum is reached. The lamb is then aged about four months, which, with us, corresponds to about the middle of September. From that time onwards there is a gradual reduction in the amount of weight increase per day. In comparing the ewes it is seen that the Border Leicester-Merino leads in every case, and shows the greatest average increase per day when mated with the Dorset Horn. During the fourteenth to sixteenth week this breed of lamb lays on flesh at the rate of 0.84lb. per day, closely followed by the lamb from the same ewe by Shropshire, which increases at the rate of 0.81lb. per day. The slowest mean increase per day recorded in these tests, namely, 0.46lb., was produced by the lambs from Romney Marsh-Merino ewes when mated with the South Down. In the examination of these figures cognisance must be taken of the fact that all lambs are simply grass fed.

TIME OF MARKETING.

As the ploughing advances on the farm, the grazing areas for the lamb-breeding flock are consequently reduced, and a question of importance to the farmer is how soon will his lambs be fit to sell. A lamb loses on dressing approximately half its live weight, allowing for wastage in transit, therefore prime lambs intended for export should be marketed when they scale from 72lbs. to 76lbs. live weight. The minimum at which well-furnished lambs should be sent for slaughter is 70lbs., and this figure has been adopted in the preparation of the appended table.

TABLE X.—*Showing the Percentage of Lambs of each Cross which Reach a Marketable Weight at Certain Periods, Seasons 1921-1922.*

Lambs Marketable by End of	EWE.											
	Lincoln-Merino.			English Leicester-Merino.			Border Leicester-Merino.			Romney Marsh-Merino.		
	Lambs by			Lambs by			Lambs by			Lambs by		
	D.H.	Shrop.	S.D.	D.H.	Shrop.	S.D.	D.H.	Shrop.	S.D.	D.H.	Shrop.	S.D.
	%	%	%	%	%	%	%	%	%	%	%	%
2th week	39.82	27.66	11.37	23.85	3.03	0.00	58.40	21.78	5.90	21.21	6.79	2.8
4th week	61.98	40.92	23.11	62.01	20.09	10.04	81.83	49.64	25.80	40.91	30.04	8.6
6th week	87.50	75.17	48.49	80.96	52.69	37.54	98.82	80.54	62.74	81.81	73.30	39.2
8th week	95.00	83.16	64.78	92.15	70.04	58.88	100.00	87.44	88.54	92.42	95.04	59.7
10th week	97.50	88.72	84.48	96.88	87.49	84.17	100.00	93.52	100.00	98.48	96.77	84.9
lambs below export weight	2.50	11.27	15.52	3.12	12.51	15.88	0.00	6.48	0.00	1.52	3.23	15.6

Export lambs are rarely shorn, as the value of the wool is comparatively small; moreover they are liable to be depreciated in value as a result of the handling and drafting inseparable from shearing operations. Consequently most of the lambs which have not attained the required standard by the end of the twentieth week would probably have to be carried on to the following autumn. The last weighing corresponds to the first week in October, and all the lambs held after

that are better shorn. Here again the Border Leicester-Merino-Dorset Horn cross leads the way, and approximately 84 per cent. of the progeny are saleable towards the end of August, and 99 per cent. early in September. Lambs which can be placed on the market early in the season are mainly by Dorset Horn, followed by the Shropshire and a few South Down, the highest numbers being secured from the Border Leicester and Lincoln-Merino ewes, followed by English Leicester and Romney Marsh-Merino Ewes in that order. Our experience has been that the English Leicester-Merino ewe does not mate as early in the season as the other half-breeds, consequently many of her lambs are comparatively late, and are at a disadvantage for early marketing. The lowest percentage of immature lambs is found in those sired by Dorset Horn. Further, the Dorset Horn lambs appear to recover more quickly after a check than those by the other two breeds.

LOSS OF WEIGHT ON TRANSIT AND DRESSING.

The figures given in the following tables represent the results obtained from five lambs of each breed, and indicate that a considerable amount of weight is lost between the time of leaving the farm and reaching the saleyards. Although it is difficult to say the quantity, yet a certain percentage of this weight must be represented by loss of tissue.

TABLE XI.—*Showing the Loss of Weight in Travelling to Market and the Loss of Weight in Dressing of Lambs from Merino Ewes, Season 1923.*

Sire.	Average Weight.			Average Loss.		
	Farm.	Abattoirs.	Dressed.	Transit.	Dressing.	Total.
	lbs.	lbs.	lbs.	lbs.	Per cent.	Per cent.
Longwools—						
Lincoln	75.2	69.4	35.6	5.80	48.70	52.66
English Leicester .	72.4	66.8	35.2	5.60	46.71	51.38
Border Leicester .	71.0	66.75	32.25	4.25	51.31	54.23
Romney Marsh . .	71.6	66.0	32.4	5.60	50.91	54.75
Means	72.55	67.24	33.86	5.31	49.33	53.26
Shortwools—						
Dorset Horn	74.4	66.6	32.8	7.8	50.75	55.76
Shropshire	75.2	66.6	33.6	8.6	49.55	55.32
South Down	66.2	61.8	31.2	4.4	49.51	52.87
Means	71.93	65.00	32.53	6.93	49.94	54.65

TABLE XII.—*Showing the Loss of Weight in Transit to Market and Loss of Dressing of Lambs by Down Rams from Half-bred Longwool-Merino Ewes, Season 1923.*

Lambs by Dorset Horn:—

Ewe.	Average Weight.			Average Loss.		
	Farm.	Abattoirs.	Dressed.	Transit.	Dressing.	Total.
	lbs.	lbs.	lbs.	lbs.	Per cent.	Per cent.
Lincoln-Merino . .	78.60	72.0	40.4	6.6	43.89	48.63
Eng. Leic.-Merino	76.40	71.0	38.4	5.4	45.92	49.74
Bord. Leic.-Merino	76.00	70.4	37.6	5.6	46.59	50.53
Rom. Marsh-Merino	74.00	68.6	36.0	5.4	47.52	51.38
Means	76.25	70.5	38.1	5.75	45.82	50.03

Lambs by Shropshire:—

Ewe.	Average Weight.				Average Loss.	
	Farm. lbs.	Abattoirs. lbs.	Dressed. lbs.	Transit. lbs.	Dressing. Per cent.	Total. Per cent.
Lincoln-Merino ..	76.0	69.8	37.6	6.2	46.13	50.53
Eng. Leic.-Merino	73.0	67.6	36.0	5.4	46.75	50.68
Bord. Leic.-Merino	74.8	70.2	38.8	4.3	44.73	48.13
Rom. Marsh-Merino	76.6	76.4	37.4	5.2	47.62	51.17
Means	75.1	69.75	37.45	5.35	46.31	50.13

Lambs by South Down:—

Lincoln-Merino ..	75.4	69.6	39.6	5.8	43.10	47.45
Eng. Leic.-Merino	72.6	69.0	39.6	3.6	42.61	45.45
Bord. Leic.-Merino	74.2	69.8	39.0	4.4	44.13	47.14
Rom. Marsh-Merino	70.8	67.4	36.8	3.4	45.40	48.02
Means	73.25	68.95	38.75	4.3	43.81	47.02

It is to be noted that the South Down exerts considerable influence on the amount of weight lost on travelling and also on the percentage of loss on dressing. The lambs containing Lincoln blood have in every group suffered the most loss of weight in the journey to market, whilst the Romney Marsh shows the greatest loss on dressing. A comparison of these figures with those given in connection with the Merino ewe show that, although we can expect a carcass of about 50 per cent. live weight from her lamb, with that from the half-bred ewe only about 45 per cent. loss need be anticipated.

TABLE XIII.—*Showing the Monetary Value of the Various Crossbred Lambs, Season 1923.*

Dam.	No.	Live Weight.	Dressed Weight.	Value of Carcasses at 8d. $\frac{3}{4}$ lb.		Value of Fat.		Value of Skins.		Total Value.	Value $\frac{3}{4}$ lb. Live Weight on Farm. 14 week		
				£	s. d.	s. d.	£	s. d.	£		s. d.		
LAMBS BY DORSET HORN.													
coln-Merino	5	393	202	6	14 8	1	10	0	19 1	7 15 7	4	76	1 9 3
glish Leicester-Merino	5	382	192	6	8 0	1	8 $\frac{1}{2}$	0	18 3	7 7 11 $\frac{1}{2}$	4	65	1 6 8
rdor Leicester-Merino	5	380	188	6	5 4	1	10 $\frac{1}{2}$	0	19 2	7 6 4 $\frac{1}{2}$	4	62	1 10 0
romney Marsh-Merino ..	5	370	180	6	0 0	1	8 $\frac{1}{2}$	1	0 4	7 2 0 $\frac{1}{2}$	4	61	'
LAMBS BY SHROPSHIRE.													
coln-Merino	5	380	188	6	5 4	2	1	0	19 1	7 6 6	4	63	1 5 5
glish Leicester-Merino	5	365	180	6	0 0	1	8	0	18 2	6 19 10	4	60	1 3 2
rdor Leicester-Merino	5	374	194	6	9 4	1	11 $\frac{1}{2}$	0	19 2	7 10 5 $\frac{1}{2}$	4	83	1 7 2
romney Marsh-Merino ..	5	383	187	6	4 5	1	11 $\frac{1}{2}$	1	0 4	7 6 11 $\frac{1}{2}$	4	60	1 4 6
LAMBS BY SOUTH DOWN.													
coln-Merino	5	377	198	6	12 0	1	8	1	0 4	7 14 0	4	90	1 4 1
glish Leicester-Merino	5	363	198	6	12 0	1	8	0	16 3	7 9 11	4	86	
rdor Leicester-Merino	5	371	195	6	10 0	1	9 $\frac{1}{2}$	0	15 5	7 7 2 $\frac{1}{2}$	4	76	1 4 2
romney Marsh-Merino ..	5	354	184	6	2 8	1	8	0	15 10	7 0 2	4	75	
LAMBS FROM MERINO EWES.													
coln-Merino	5	376	178	5	18 8	1	6 $\frac{1}{2}$	0	17 10	6 18 0 $\frac{1}{2}$	4	41	0 19 3
glish Leicester-Merino	5	362	176	5	17 4	1	11 $\frac{1}{2}$	1	5 2	7 3 5 $\frac{1}{2}$	4	79	1 1 11
rdor Leicester-Merino	5	347	158	5	5 4	1	2	0	19 6	6 6 0	4	35	0 16 11
romney Marsh-Merino	5	358	162	5	8 0	1	6	1	6 0	6 15 6	4	54	1 0
rdor Horn-Merino	5	372	164	5	9 4	1	7	0	16 11	6 7 10	4	12	1 1
Shropshire-Merino	5	376	168	5	12 0	1	7	0	19 11	6 13 6	4	26	1 2 10
South Down-Merino	5	331	156	5	4 0	1	1 $\frac{1}{2}$	0	15 0	6 0 1 $\frac{1}{2}$	4	35	

Summarising from the above data the following averages are obtained:—

Average return per lamb at age of 14 weeks.	£	s.	d.
1. Dorset Horn Ram x Longwool-Merino Ewe	1	7	10
2. Shropshire Ram x Longwool-Merino Ewe	1	5	1
3. Southdown Ram x Longwool-Merino Ewe	1	3	2
4. Down Rams x Longwool-Merino Ewe	1	5	4
5. Down Rams x Merino Ewes	1	1	5
6. Longwool Rams x Merino Ewes	0	19	7
7. Down and Longwool Rams x Merino Ewes	1	0	4

In Table XIII. the value of the carcass has been assessed at a flat rate of 8d. per pound, for although export lamb is valued according to the grade, yet, as far as the local market is concerned, weight appears to be the main factor in fixing the price. In order to secure the export value of one strain compared with another, it would be necessary to ascertain the percentage of lambs of each grade that can be expected in that particular cross under average conditions. For instance, it is quite possible that one cross may average a greater number of super and first grade carcasses than another, and in consequence merit a higher price per pound. At present we are not able to supply information on this question, but it is a phase which it is proposed to investigate.

The Metropolitan Abattoirs' price for fat has been adopted, namely, 1½d. for first grade and 1d. for second. Mr. Rosman, of Wilcox, Mollin, & Co., kindly valued the skins, and in his report commented upon the fact that in some instances the type of wool followed the ewe and in others the ram. This was very noticeable in the South Down crosses, which were very short in the staple. The highest returns for skins were obtained from lambs by Romney Marsh rams from Merino ewes. This sire appears to influence the skin value, and except when mated with the South Down has in each group shown the greatest monetary return.

The amount of weight which the breed loses on dressing affects the value per pound live weight, and we find the highest price per pound given for lambs from English Leicester-Merino ewes by South Down rams. On reference to the previous table it will be seen that this cross gave the lowest percentage of loss on dressing. The last column of the table has been obtained by taking the average weight of lambs of each cross at the end of the fourteenth week, and applying the value per pound live weight. By this means we are able to arrive at the comparative values of the various crosses. At the age of fourteen weeks it is observed that the lambs by Dorset Horn from Border Leicester-Merino ewe show a value of 30s. per head. Lambs by the same sire from Lincoln-Merino follow with an average of 29s. 3d. per head, whilst next in order of merit is the Shropshire-Border Leicester-Merino lamb, showing a monetary value of 27s. 2d.

Dealing with the half-bred ewe, we see that the Border Leicester-Merino occupies the top position in each group. When the Merino ewe is used as the mother, the progeny of the Shropshire show the greatest cash value, whilst of the lambs sired by longwools, those by English Leicester are the most remunerative. These money values have been based on Abattoirs' rates this season, and since the sales took place

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before the export buyers were able to operate, local values, and not export value, have been adopted. It is possible that when the export trade values prevail a higher price per pound would be realised by sellers of South Down and Shropshire crosses, as these will generally command higher average figures on the London market.

No definite conclusions can be given from tests which have been carried out over such a limited period, but the results so far obtained tend to indicate:—

That the Shropshire is the most profitable ram with which to mate the Merino ewe, although the progeny of the English Leicester and Dorset Horn are but little inferior.

That the Border Leicester-Merino is the most profitable of the half-bred longwool-Merino ewes under test.

That when mated with half-bred Longwool-Merino ewes the Dorset Horn ram produces the earliest maturing and most remunerative lamb at local values.

In conclusion, I wish to place on record our indebtedness to Mr. G. A. W. Pope (General Manager) and Mr. J. D. Sellars, of the Government Produce Depot, for their help and co-operation in this work; also to Mr. Ive (Works Manager) for allowing these tests to be carried out at the Metropolitan Abattoirs.

DISCUSSION.

Mr. W. H. Cumming (Strathalbyn) said that he considered the searing iron for tailing more cruel than the knife. Mr. H. Saunders (Nunkeri and Yungo) asked whether there would be a corresponding increase in the loss of weight according to the length of the journey from the farm to the market. If the export trade was to be encouraged or fostered it would appear that a more up-to-date method of marketing or transport would be required. Mr. F. Masters (Roberts and Verran) pointed out the difficulties under which the farmers on the West Coast had laboured in marketing their lambs. They were now providing a freezing works at Port Lincoln, and any information they could secure regarding the best breeds to employ in catering for the fat lamb market would be most useful to them. He was pleased to hear that results of breeding crossbred lambs from Merino ewes were being compiled, because he was of the opinion that they would have to adopt that course owing to the difficulty of obtaining crossbred ewes. Mr. A. L. Molineux (Tarlee) stated that he had obtained good results over a number of years with the Shropshire-Merino cross. Later he had tried Dorset Horn-Merino cross with excellent results; they produced an early maturing lamb, and he considered that was the best cross for the small farmer in the lower and middle northern districts.

Mr. R. Scott, in reply, said he did not consider the use of the searing iron more hurtful than the knife for tailing, and his experience had been that it affected the lambs to a lesser degree.

Tuesday, September 11th.—Evening Session.

Mr. A. H. Codrington (Wool Instructor of the School of Mines) delivered an address in which he dealt with the "Classification of the Farmers' Clip for Market."

ROOT CROPS AND THEIR VALUE.

The following paper was presented by Mr. H. B. Michelmore of the Meadows Branch:—

It is at the season of the year when the succulent feed has disappeared and the stored dry fodders have to be relied upon that the farmer, especially the dairy farmer, regrets that he has nothing upon which he can fall back to provide the nourishing food which stock generally relish. We, as dairymen, have not yet learned the lessons taught by the English and New Zealand producers in relying upon root crops to tide over the period of shortage, neither have we fully appreciated the fact that roots, such as turnips, mangolds, &c., are economical flesh and fat producing fodders, and on the dairy farm have qualities for milk production that are rarely excelled. Broadly speaking, the Australian dairymen relies upon lucerne to prevent a food shortage on his farm, and where lucerne can be grown successfully the anxious period of winter and early spring is easily negotiated, for lucerne can be used in the green stage in the spring, summer, and autumn, and in the form of hay during the winter. However, the addition of a few roots to the hay ration, though not absolutely essential, is highly desirable. But there are hundreds of farms on which lucerne cannot be successfully grown, and, therefore, its place must be taken by annual fodder crops. The choice, therefore, lies in such cases between hay, or roots and hay, for winter, and green annual forage, such as sorghum and maize, for summer on the one hand, and on the other, a never-failing supply of ensilage for both summer and winter use; but the best subsidiary fodder to ensilage is undoubtedly the root crop. The essence of farming is the production of crops that either in themselves represent marketable commodities, or are capable of being converted into such commodities through the agency of live-stock. Of all farm animals, the dairy cow is the most efficient in this regard. The fact that the dairy cow is able, from a given weight of food, to produce a greater quantity of saleable product than any other animal means that crops fed to cows are of greater value than when fed to any other class of animal. In consequence, it is in the feeding of cows that the greatest advancement can be made at the present time. It is not by any means overstating the case to say that a very large proportion of our dairy cows are not fed sufficiently during the year to enable them to yield their maximum capacity. Very often the adequate feeding of dry cows is much neglected, and this has a very potent bearing on the low average yield of milk and butter fat production. The idea, apparently, is that under-feeding the cows during the dry period will reduce the amount devoted to maintenance. Such a system in no way accomplishes this, but tends very seriously to reduce the butterfat yield in the following season, because a large proportion of the spring feed is used to replace the weight lost in the winter. It is, therefore, desirable that all dairy cows should commence their season in really good condition. In our district we should make hay and roots the staple winter feeds. We have yet to learn the important position roots should occupy in the supplementary feeding of dairy cows. Where swedes can be success-

fully grown they can profitably be made, with hay, the main winter feed. Apart from their high yield, the fact that they can be grazed off renders them an excellent cheap crop to grow. The feeding of roots is not a subject that can be dismissed briefly, or one that can be undertaken lightly by the dairyman, but it will pay dairymen to experiment in feeding roots for future guidance. The determining factor as to whether swedes or mangolds should be grown as the chief root crop is undoubtedly the soil, the swede being, generally speaking, a light land crop and the mangold the heavy soil crop. There are, of course, some soils that will grow both crops equally well, and it is always possible to grow mangolds on light land and swedes on certain heavy soils, but, as a general rule, swedes do better on lighter soils and mangolds on the heavy. There are, however, several points connected with the feeding value of the crops that are worth some thought. One is the weight of the actual feeding material that can be produced per acre by either crop. Chemical analysis shows that no very marked difference exists in the percentage of dry matter contained in the two crops on the average, though possibly the mangold may contain slightly more than the swede. The swede grown with phosphates on suitable soils may reach 14 per cent. of dry matter, while the mangold (long red) may give as much as 16 per cent. of dry matter and seldom fall below 12 per cent. Such facts as these are well worth remembering, for it is apparent that if a crop of roots, weighing 20 tons per acre, contain 10 per cent. of dry matter, it will give two tons of actual feeding material per acre without the water, while, if a crop of the same weight per acre contains 15 per cent. of dry matter, the yield of actual feeding material will be three tons. Much has been said to show that both swede and mangold are excellent food for dairy cows, particularly the mangold during the finishing months of the average spring, but it should be always fed with extreme care at the beginning, even after it has been stored for a fairly lengthy period. The milk may have a distinct and unpleasant taint if the cows are confined to the swede crop all day. When swedes are fed to milking cows, they should be given a short time after milking. Mangolds, on the other hand, impart no undesirable flavor to the milk, but, nevertheless, care must be exercised in feeding them. No attempt should be made to allow the cows to graze off root crops during the winter months. It is infinitely better to cart a certain quantity of roots to the pasture daily, where they should be well spread about so that the greedy "boss" cows have no chance of getting more than their share. Over-feeding must be guarded against, for it sets up severe purging. To prevent illness, however, little care only is necessary. Much more care is required when feeding mangolds than when feeding swedes.

In the discussion that followed, Mr. H. Davis (Pinnaroo) expressed the opinion that as a general rule farmers did not pay sufficient attention to the growing of root crops. All classes of livestock seemed to fatten very rapidly on turnips. Last year he had tried mangolds mixed with vetches, which provided an excellent pick-
ing for the sheep that were grazed on the stubbles, and it

was his intention to continue the practice in future years. He also proposed to grow barley for fattening pigs, and to grow turnips and mangolds in small paddocks in which the pigs could be grazed. Mr. S. J. Bonney (Kalangadoo) said he grew a fair area of mangolds every year and asked whether the writer of the paper did not think it would be more economical to pulp the mangolds and feed them in conjunction with dry matter. Mr. C. Ricks (Cherry Gardens) thought that a considerable loss would be experienced if the mangolds were carted out and spread on the ground for feeding the dairy cattle. In addition to that the "boss" cows of the herd would keep the other animals from getting a fair share of the feed. A better plan was to make small troughs on wheels out of which the cattle could be fed. The Director of Agriculture (Prof. Arthur J. Perkins) congratulated the writer on the excellent paper that had been contributed to Congress. The Director agreed with Mr. Ricks that waste would be experienced if the method suggested in the paper was adopted. Mangolds, generally speaking, should be ripened before being fed to cattle, but the handling of practically any of the root crops involved a deal of labor. The crop should be pulled in autumn, the roots stacked in heaps, similar in shape to the heaps of metal that were seen on the road side; then covered with earth, and left until required for use. Provision, however, had to be made for the ventilation of the stack of mangolds. If that practice were adopted the mangolds would become quite sweet. Root crops required a fair amount of tillage during the growing season. Land on which the root crop was grown was usually required at a later stage for some other crop, and as root crops had a tendency to produce a foul growth of weeds, fair tillage operations were necessary. Root crops were very desirable in certain districts and were undoubtedly useful to the stock, but the farmers always had to consider whether there were not other crops of a more suitable nature for the conditions of the district. Root crops were chiefly grown in those districts where winter growth was not abundant. In districts where winter feed was short, farmers had a choice of either root crops or ensilage. The question that then arose was, "Which is the most economical form of conserving fodder"? Personally the Director favored ensilage, after the expense incurred in the initial outlay had been faced. Most of the cruciferous plants tainted milk and all dairymen should be careful how they were used. Mr. R. Wheaton (MacGillivray) mentioned that he had grown turnips for several seasons and had always obtained best returns by sowing the seed any time after the beginning of November and up to the commencement of January, after a good rain had been received. Mr. Michelmore, in reply, agreed that pulping the mangolds was a much better practice than carting them in bulk out on to the land. His experience regarding the time of sowing was that the later in the season the seed was sown the better results it would give. He favored sowing about the first week in January, when only very few weed seeds would germinate, and tillage operations would be reduced to a minimum.

CULTIVATION OF THE SOIL.

Mr. W. J. Spafford (Superintendent of Experimental Work) then read the following paper:—

Soil cultivation, or soil tillage, is of the utmost importance where crop-growing is being considered, and when the factors controlling successful husbandry are to be taken into account, it is very doubtful if any one of the agents over which man has an influence, is of equal value. If it be possible to put the principal instrumentalities governing the production of profitable crops in their order of importance, they would probably be placed somewhat as follows:— (1) climatic conditions, (2) soils, (3) cultivation, (4) rotation of crops, (5) fertilisers, (6) varieties, etc., etc., and if this is so, when we have discovered a new but favorable set of natural conditions, existing in conjunction with arable soils, our first concern of any consequence when we undertake to grow crops, will be to find the best manner to cultivate the soils for the crops we set about growing, and our success in crop raising will depend very largely on our ability to attain this knowledge comparatively quickly. This will apply to all types of crops in all countries, and has already been proved for every crop we grow in this State, and has been particularly striking in the case of the crop we have almost specialised in, namely wheat. This is not generally recognised by South Australian farmers, largely it appears, because the very extraordinary and astonishing effects of applications of light dressings of phosphatic fertilisers to our wheat crops are still fresh in the memories of most of them. It is but a few years ago, that wheat growing, which had fallen below a profit-earning business in many districts of the State, was suddenly put on a lucrative basis by the use of phosphates, in all of those districts possessing favorable climatic conditions. This rapid and remarkable alteration in the results secured from our wheat growing activities, appears to have made such an impression on farmers' minds, that it is still generally considered that the discovery of the value of applications of superphosphate to our wheat crops, has been the greatest advancement we have made towards success with this crop, and it seems that the abruptness of the improvement wrought, has largely overshadowed what we have learned of other cultural methods, for our particular conditions. Although the amelioration of our cultivation practices, has been much more gradual than in the case of the use of superphosphate, nevertheless it has had at least an equal effect on our present day success with the handling of wheat crops, and in the future will have a much greater one. A glance at the following figures will serve to show the present day

efficacy of a dressing of superphosphate to a wheat crop, compared to the returns obtained from well tilled land, not manured:—

Effect of Superphosphate on Wheat in Well Tilled Land.

Farm.	Mean Yield per Acre.						Period.
	No Manure.		1cwt. Super		Increase over		
	Bush.	Lbs.	per Acre.	No Manure.	Bush.	Lbs.	
Roseworthy Agricultural College ..	14	53	18	33	3	40	1905-22 (18 yrs.)
Veitch Experimental Farm ..	14	4	16	49	2	45	1915-22 (8 yrs.)
Booborowie Experimental Farm ..	20	39	29	29	8	50	1917-22 (6 yrs.)

The figures used are selected from three districts representing the bulk of our wheat-growing country—Roseworthy Agricultural College, with calcareous soils, with an average annual rainfall of 17.29in., and typical of our better mallee districts; Veitch, with light-textured, calcareous soils, only registering an average annual rainfall of 12.89in., and fairly typical of much of our comparatively low rainfall mallee country; Booborowie, with red-colored, heavy-textured, fertile soils, recording an average annual rainfall of 17.44in., and typical of much of our lower north.

It is a fact, clearly remembered by many South Australians, that before the introduction of phosphatic fertilisers to this State for wheat-growing, the district which is represented by Roseworthy Agricultural College, did well, when the wheat crops returned more than an average of 6bush. per acre. An examination of the figures compiled by the Government Statist, shows that in County Gawler, which includes Roseworthy College, the average yield of wheat, for the 18 years preceding the general use of superphosphate, that is to say, from 1876 to 1893, was only 5bush. 45lbs. per acre. Now the figures given above for the Roseworthy Agricultural College indicate that the application of 1cwt. of superphosphate per acre to wheat crops, has only given an average increased yield of 3bush. 40lbs. for the past 18 years, over and above the yields secured from wheat crops grown on land not manured, whereas all improvements in our farming methods, made since fertilising with phosphates was originated, are shown to give on the experimental plot receiving 1cwt. of superphosphate per acre, an average increased yield of between 12bush. and 13bush. per acre, in excess of what could have been expected before the value of dressings of superphosphate became known. For the same 18-year period—1905 to 1922—the wheat crops of County Gawler produced an average yield of 13bush. 9lbs. per acre. As the climatic conditions and the soils at Roseworthy Agricultural College, are not better than those of the average farm on which wheat is produced in County Gawler, it is

only reasonable to suppose that the heavier crops grown, are due to the fact that better farming methods are practised at that institution than by the average wheat grower of the county, still the average increased yield of 7bush. 24lbs. per acre for this county, since superphosphate was introduced, is greater than can be expected from the use of this fertiliser alone.

The increase in present-day yields, in excess of that which is brought about by dressings of phosphatic manures, is not of course, wholly due to improved soil-tillage practices, but although some of the improvement is due to the complete alteration in the type of variety grown, the carrying of greater numbers of grazing livestock, resting the land, etc., etc., the progress made in methods of cultivation, is easily the most important of the noticeable causes of this advancement. In the particular block of land where these experiments were conducted, the resting of land and the carrying of large numbers of farm livestock, which has such a marked improving effect on the crop producing powers of land, have not played a large part towards the increased yields, because the plots have been carried out on the bare fallow—wheat—bare fallow—wheat rotation, and all wheat crops have been cut with a binder when ripe and then threshed, and the only grazing available has consisted of a short stubble, and the little that grows between harvest and ploughing times.

The really high yields from land not manured, as quoted above, will only apply for land which is barefallowed, and where thorough and correct cultivation practices are used, and under such conditions show what can be done with proper methods.

Applications of superphosphate to the soil certainly placed crop growing in South Australia on a firm basis, and in enabling farmers to again make profits, was the general incentive to further progress, the principal line followed being that of better soil tillage. We know also, that in most of those places, where for any reason the soils cannot be cultivated in the best possible manner, profitable crop-growing without the use of phosphatic fertilisers is practically impossible, and that in the best of conditions in this State, even with good tillage, applications of phosphates prove directly profitable to crops, increase the grazing capacity of the soil after the crops are harvested, and render the land conducive to good health in the livestock supported on it. Phosphatic manures have helped our agriculture very considerably, but while we have been giving them full credit for what they have done, we have been inclined to lose sight of the agricultural knowledge gained in other directions, and it appears now, that we



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have learned so much regarding the cultivation of our soils, that, in common with all countries which have been well farmed for any length of time, we can claim that proper cultivation of the soil does most towards successful crop-growing.

The importance of tillage, applies to the soil preparation for all of the crops we grow, and although we have made very rapid progress in our methods of cultivating the soil, still more can be done, and a knowledge of the why and wherefore of the various operations, should hasten on the required forward movement.

WHY WE CULTIVATE THE SOIL.

Where the climatic conditions are not too severe to prevent plant growth, practically all soils naturally support plants of some kind or other, so showing that cultivation is not essential to the growth of plants.

The crowding of human beings on to comparatively small areas, however, has necessitated the production of much more vegetable food from the soil, than will grow there naturally, and in bringing about this increased growth, it has been found to be of fundamental importance, that the land be tilled, and that the more precise this tillage is, the greater will be the growth obtained. This process of increasing plant growth by cultivating the soil, has been practised for a very considerable time, with most of the crops which we grow to serve the needs of man, and during this time most of the plants handled, have been so altered, as to be at present very unlike the "wild" plants from which they were originally derived. In this transformation, the plants have lost their original hardiness, and cannot compete with plants which have not been pampered to the same extent, such as those we know as weeds, and this long course of special soil treatment has not only rendered all of the cultivated crops largely dependent on good soil tillage to produce heavy yields, but many of them now rely on the thorough stirring of the soil, for their very existence. We see this with the cereals, which on well cultivated land in this State, will make strong growth, and if the crops be left unharvested, and livestock be kept from them, will possibly produce fair "self-sown" crops, but if left another year, very few, if any, plants will grow at all, and finally all will disappear from the land.

PRINCIPAL MEANS BY WHICH THE OBJECT OF SOIL TILLAGE IS ACHIEVED.

Soil tillage has the one object of producing maximum returns from the crops the cultivator sets about growing, and it does this by rendering possible the crowding of more plants on the land than will grow there naturally, and by eliminating other kinds of plants, which would compete with the crop for air, moisture, and mineral plant food.

Of the many ways in which plants are helped by tillage towards this goal, the following are of great importance, and require consideration:—

- (a) Increasing the supply of air in the soil.
- (b) Admittance and retention of soil water.
- (c) Rendering soil mineral matters available to plants.
- (d) Encouraging the activities of the useful soil bacteria.
- (e) The control of weeds.
- (f) The creation of the seed bed.

INCREASING THE SUPPLY OF AIR IN THE SOIL.

It is a well-known fact, proved by a great number of experimenters, that a direct supply of oxygen is indispensable to the roots, as well as to the other growing parts of the plant, and also that a plentiful supply of this gas is necessary for the rapid germination of seeds. It is generally recognised, that the increased growth of plants which follows good soil tillage, is very largely due to the fact that a greater supply of air is accessible to their roots, and, that an abundance of air is necessary, must have been noted by most farmers, because it is by no means an uncommon occurrence for crops to die, and seeds to fail to germinate, for the lack of oxygen, when air is excluded from the soil by the presence of an excess of water.

A plentiful supply of air in the soil is of the utmost importance to encourage the activities of the useful soil bacteria, by supplying oxygen for the direct needs of the bacteria, for the oxidation of the organic matter, and as a direct supply of nitrogen, and the greater the amount of air admitted to the soil, providing also that water be present, the larger the quantity of mineral plant food which is rendered available to plants, from its insoluble combinations.

These latter points will be considered in more detail under the headings "Rendering Soil Mineral Matters Available to Plants" and "Encouraging the Activities of the Useful Soil Bacteria," but it must be remembered, that in a general way, cultivating the land allows much more air to enter the soil than can get there naturally, and this increased and more regular supply, admits of a greater number of plants being grown on a given area. When land is left uncultivated it obtains most of its air by direct absorption, and by changes of barometric pressure, and in these conditions, because of the limited air supply, plants must have much of their root systems near the surface, to get sufficient oxygen, with the inevitable result that they tend to crowd one another out. Tillage operations increase the amount of air a soil can take, by increasing the pore space of the soil, and by directly aerating it when the implements lift up the particles.

ADMITTANCE AND RETENTION OF SOIL MOISTURE.

Growing plants require water throughout their vegetative period, and this water is uninterruptedly pumped from the soil by the roots, passed up the tissues of the plant, and after some small proportion is retained, the bulk of it is evaporated from the leaves. The rigidity of the growing parts of most plants is dependent on the presence of an adequate supply of water, and when for any reason, they cannot get sufficient of this substance for their needs, they become flaccid, or, as we usually say, they wilt, and should the supply be cut off altogether they will die. This incessant flow of water from the soil to the leaves, during the whole life of annual plants, means that an enormous amount of water must be accessible to the roots of the crops we grow, and as the amount actually transpired has often been measured, a glance of some of the figures obtained will help to demonstrate how very important water is to plant growth. Many experimenters in other countries have also ascertained the water requirements of growing plants, but the figures secured in the neighboring State of Victoria by the Superintendent of Agriculture (A. E. V. Richardson, M.A., B.Sc. (Agric.)) are likely to be most applicable for South Australia. Mr. Richardson has been measuring the amount of water passing through various crops, for some years now, at both Rutherglen and Werribee, and has found that for every pound of dry matter formed by the wheat crop, the water transpired by the plants, has varied from 271½lbs. to 518lbs., with an average of about 428lbs. If we apply this average figure of 428lbs. of water needed for each pound of dry matter formed, to a crop of wheat the total produce of which weighed two tons, and contained 10 per cent. of moisture when harvested, we will see that the crop required about 173,000 gallons of water per acre, equal to more than 7½ inches of rain, to pass through the tissues of the plants between germination and maturity. These figures certainly help us to realise the importance of water to growing plants, and as cultivation does much towards allowing the maximum amount of the rain that falls to enter the land, and if properly practised tends to retain this in the soil, it is of considerable value in helping crops in this direction.

ADMITTANCE OF WATER INTO THE SOIL.

All soils when left undisturbed tend to become fairly compact at the surface, and when rain falls, it finds some difficulty in entering them, and if the rain showers be at all heavy, only a part of the water enters the soil, and much runs off the surface. Stirring the land with tillage implements roughens the surface, and presents obstructions to the flow

of water, with the inevitable consequence that much more of the rain that falls sinks into the soil, than is the case where it is left untilled.

It is a matter of common knowledge that cultivation increases the bulk of the soil, as can be plainly seen while land is being ploughed, for then the freshly ploughed land is usually inches higher than the unploughed portion. As this increase in bulk does not mean an increase in the number or size of the particles of the soil, it must mean an increase in the pore spaces, and this augmentation of the soil spaces makes room for more water, and so cultivation not only increases the ease with which the rain will enter the soil, but it also allows the soil to hold more water.

RETENTION OF WATER IN THE SOIL.

When water enters the soil it gradually sinks downwards, attracted by the force of gravity, and it is reasonable to suppose that if this was the only force acting on the soil water, it would eventually be drawn so far into the soil that it would pass beyond the reach of plants, or else arrive at an impervious layer and then run away. But, while the force of gravity is pulling the water downwards, another powerful natural force, known as surface tension, is also acting on the water, pulling it to the soil particles. Surface tension, or the attraction of the surfaces of the solids for liquids, is commonly evidenced in every-day life, by such instances as (1) the inside of a glass tumbler retaining water after pouring out the water with which it was originally filled, and (2) the holding together of the hairs of a brush, which are usually distended when dry, as with a shaving brush or paint brush, after plunging it in water.

Now these two forces act in opposition to each other at one and the same time—gravity pulling the water downwards, and surface tension pulling it to the soil particles, until a state of equilibrium is reached between the two, and then the water sinks no farther. When the soil water comes to rest it is in the form of a very thin film of water surrounding all of the soil particles, and is continuous from the surface to the depth to which it was pulled by gravity. This continuous film of water surrounding the soil particles resembles a stretched rubber band, and the movement in the soil of this water, is dependent on the fact that, like the rubber band, the greatest pull is at the thinnest part. That this is so can easily be demonstrated by suspending a weight on a strip of rubber, then further stretching the top portion of the rubber, and when the bottom grip used for the stretching is freed, the weight will immediately rise. When the sinking of the soil water has been arrested, evaporation takes place at the surface of the soil, with the result

that the film of water is thinned at the surface, and as the greatest pull is where the film is thinnest, the water rises to make good the losses, and while the water film surrounding the soil particles is continuous to the surface, this evaporation, and rising to make good the loss, continues until the soil becomes dry. The rise of subsoil moisture can only happen while the film surrounding the soil particles is continuous from the surface downwards, and anything which breaks this continuity of the film tends to prevent this rise, and the consequent loss by evaporation. We see this happen where parts of a garden have been mulched, for in the summer when the unprotected soil seems quite dry, if the mulch of straw or coarse stable manure be scraped off the land, the surface is usually quite moist; and it is often seen in the field where a bag has been allowed to lie, and when this bag is lifted the soil surface is damp while all surrounding it appears quite dry. The mulch and the bag break the continuity of the soil moisture film, and protect the moisture from the evaporating agents—wind and sun—and exactly similar work is done by cultivation, for when we cultivate land after rain, we break the continuity of the film of water and make a soil mulch, which tends to prevent the rise of the water above the point reached with the cultivating implement, and the layer of loosened soil protects the moisture from the evaporating agents. The soil moisture only rises freely to the point where the film is continuous, and although some evaporation takes place after cultivation, it is not difficult to realise that if the position where the evaporation of the soil moisture is taking place, is two inches below the surface, the losses will only be a fraction of what would occur where the soil is left firm, with the film intact right to the surface. The first heavy rain after cultivation re-establishes the continuity of the film, and so to properly conserve the soil moisture, the land should be cultivated after every rain which is sufficiently heavy to form a crust on the surface of the soil. This can be illustrated by what happens with a brick and a sponge; for if we fill a sponge with water, and hang an ordinary red building brick so that it touches the sponge, it will withdraw practically all of the water, but if the brick be filled with water a dry sponge will extract very little from it. When we cultivate we make the surface of the soil like the sponge, and if we are trying to conserve moisture, we never allow the surface to remain like the brick, but always keep it loose and open like the sponge.

RENDERING SOIL MINERAL MATTERS AVAILABLE TO PLANTS.

Some mineral matters are quite essential to plant growth, and most of what is collected of these mineral foods is to be seen in the

ashes remaining after the plants are burnt, and although the total quantity is comparatively small, a plant cannot grow unless its requirements in this direction are met by the presence of adequate supplies in an available form. The mineral matters are collected by the roots of plants from the soil, and as far as we now know they can only be absorbed by plants when in solution in the soil moisture, and so anything we can do to render the mineral matters in the soil soluble in the soil moisture, will be of the greatest value.

Most normal soils are well supplied with the mineral matters needed by the plants as food, but very little of it is available to plants at any given time, as availability means solubility in soil moisture. If the stores of mineral plant foods were not mainly of non-available form, in times of heavy rains most of them would dissolve in the soil moisture, and be carried away in the drainage waters.

With many substances, solubility depends on fineness of subdivision, and as a case we can instance that of glass, which every one knows, in the form of a bottle or a tumbler, to be able to withstand liquids of most kinds for a very long period of time, yet if a glass vessel be broken up and powdered to a very fine dust, water will dissolve an appreciable amount of it. The non-available mineral plant foods are in their present form, because the particles containing them are not subdivided sufficiently to admit of their being dissolved, and they are only very gradually being rendered soluble by the further splitting up of the soil particles, but the tillage of the soil very considerably increases the amounts liberated, over and above what is the case with unstirred soils.

Soils have been formed by the disintegration of the rocks which originally formed the entire crust of the earth, under the action of natural agents, the principal ones of which are:—Moving water, glaciers, changes in temperature, winds, etc., with mechanical action, water, carbonic acid gas, oxygen, etc., with chemical action; and the growth and decay of plants. These natural agents are still at work, and as the soil particles, which are mainly small rock fragments, must be split up into still smaller particles if they are to become soluble in the soil water, we endeavor to encourage some of these disintegrating agents to work for us, and so we expose the soil as much as possible to the action of changes of temperature, water, carbonic acid gas, oxygen and bacteria.

Remembering that mineral matters must be soluble in soil moisture to be collected by plants, and that solubility depends on fineness of subdivision, the importance of exposing fresh soil particles, to the natural agents capable of splitting them up sufficiently fine to render them soluble, will be readily realised.

ENCOURAGING THE ACTIVITIES OF THE USEFUL SOIL BACTERIA.

Despite the fact that until fairly recently, soil was considered to be an inert mass, it is a generally recognised fact nowadays, that practically all soils, for some depth from the surface contain a great mass of many forms of life, including a multitude of microscopic size, and it is known that many of these minute kinds are wholly useful to man in his crop-growing endeavors. Although the activities of these soil bacteria are still but imperfectly understood, they certainly help the soil cultivator, and the work done by the useful kinds is of such importance, that it is generally recognised that the maintaining of soil fertility, is very largely a question of rendering the soil a fit medium for soil bacteria.

The useful soil bacteria undoubtedly contribute towards the success of the crop-grower, by (1) liberating mineral plant food from the complex combinations in which much of it is held, (2) splitting up organic matter, (3) converting nitrogen compounds not available to plants into nitrates, (4) collecting nitrogen from the air and storing it in the soil.

(1) As has already been pointed out, the mineral matters needed by plants, only become slowly available, but this process is hastened when bacteria are encouraged, because they digest these minerals and leave them behind in a state which higher plants can use, and in their activities, they liberate acids which help to disintegrate the soil particles.

(2) Organic matter is not a direct plant food for green plants, and is not useful to them until oxidised and split up into its component parts, which achievement is brought about by these bacteria.

(3) As far as we now know, most plants can only utilise nitrogen when in combination as a nitrate, and the conversion of other forms of this substance is done by the soil bacteria.

(4) Nitrogen is one of the essential plant foods, but plants can only use it when it is in combination as nitrates, and although there are enormous quantities of nitrogen in the world, it is mainly in the free state, and being a very inactive substance, it does not readily combine with other matters, and so many soils are deficient in nitrogen, in a form suitable for plants. Notwithstanding the fact that about four-fifths of the air consists of nitrogen gas, and plants are surrounded by this air, they cannot help themselves to the nitrogen, but some of the soil bacteria, (a) living in partnership with leguminous plants, and (b) living on dead organic matter, have the power of collecting this free nitrogen from the air, and storing it in the soil in combination as various nitrates.

Bacteria, like all other forms of life, require an adequate supply of food, moisture, air, and more or less regular warmth, if their maximum activities are to be exerted, and tillage practices are the principal means the crop grower has at his disposal, to help the bacteria along these lines. Given sufficient organic matter in the soil for the bacteria to live on, correct tillage encourages their operations by admitting a fresh supply of air every time that the soil particles are stirred, and thus renewing both the oxygen and the nitrogen required, and by storing moisture in the soil. Perhaps more important still, is the fact that where land is well cultivated, a full supply of air is admitted to the point where the moisture is stored (which, as has already been explained, is the depth to where the implements reached), and the layer of loose earth maintained near the surface, serves to keep a fairly regular temperature just where the moisture and air are in close union.

Mr. A. E. V. Richardson, in his "Wheat and Its Cultivation," gives figures which show that cultivating the land leads to an increase in the available nitrogen of the soil. A block of land at Longerenong, in Victoria, containing 72lbs. of nitrate-nitrogen per acre 4ft. deep, on June 1st, 1912, was divided into three plots, one of which was fallowed and kept well worked, another was ploughed and left as "neglected" fallow, whilst the third was ploughed and cropped. In January, 1913, immediately after the crop was harvested, the worked fallow contained 92lbs. of nitrate-nitrogen per acre 4ft. deep, the neglected fallow only 25lbs., and the cropped land merely a trace. The sampling and analysing was continued periodically until April, 1913, and the most nitrate-nitrogen found at any time in these plots was 142lbs. in worked fallow in March, 38lbs. in the neglected fallow in February, and 46lbs. in the cropped land in March.

That this encouraging the soil bacteria to collect nitrogen is of great value to us will be realised if we remember that in many countries which have been farmed for a long time, it is not at all unusual for the farmers to find it necessary to use with their cereal crops, 1½cwt. or more per acre of such nitrogenous fertilisers as nitrate of soda or sulphate of ammonia.

CONTROL OF WEEDS.

Weeds, being plants, have the same requirements as the crops to be grown, and so if allowed to develop in the soil, utilise the plant food, moisture, and air needed for the crops. Even though the weeds be returned to the soil after they have been killed, they have used in a few days, or a few weeks at the most, plant food which possibly took

months to be liberated in the soil, and it will again be a long time before these plant foods are set free from the organic matter of these weed plants. Tillage is the only means we possess of controlling most of the weeds troublesome to crops, and considering the fact that these weeds are robbers of everything that the soil can supply to our crops, it is essential that they be destroyed every time that they are in evidence on cultivated soil, and before they are any great size.

CREATION OF THE SEED BED.

The experience of all farmed countries in the world, and some of these have had experience in growing crops for thousands of years, is that given fertile soil, the physical condition of that soil at the time the seed is put into it, plays a greater part towards success with most crops than does anything else over which man has control, and as this seed bed is created by tillage operations, it behoves us to see to it that the need of a good seed bed is never lost sight of. For crops seeded directly into the field, the ideal seed bed may be described in a general way, as soil that has been stirred up, then worked down, so that it is freed from weeds, and has only a shallow layer of loose, friable soil overlying well compacted underlayers.

Practically all crops demand that the underlayers of the soil be so firm that the growing tips of the roots have to force their way between the soil particles, and if for any reason the reverse applies, that is to say, if open spaces exist in the underlayers of the soil, the growing plant gets a check, and it is a generally recognised fact that if the growth of the annual crop is restrained, it rarely recovers sufficiently to give maximum returns. The ill effects following checked growth are particularly severe should the restraint occur whilst the plant is young, and to avoid the danger of this happening, the soil directly below the seed should at seeding time be well compacted together. The depth of the layer of loose surface soil necessary to fulfil the requirements of an ideal seed-bed will of course vary with every type of crop being grown, and can be greater for those with large seed, than for the small-seeded kinds, but best returns are secured from most crops if this layer is comparatively shallow.

In this State we see the bad effects following a poor seed-bed with most crops which we grow in quantity, and it is specially prominent in the case of the wheat crop, and we know that if the wheat plants do not start well and make strong, healthy growth from germination onwards, the crop stands a poor chance of producing maximum yields. In those cases when wheat is seeded into a defective seed-bed, and sufficiently heavy rains to pack the soil together do not fall soon after seeding, the crop is very liable to be attacked by "Take-all" (Ophio-

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bolus graminis), and when the seed-bed is so loose and open that the crop gets a severe check in its early stages, the ravages of this disease are likely to be such as to lead to its total failure.

IN LOCAL PRACTICE.

In this paper I have only set myself the task of explaining some of the principal points in connection with the preparing of the land for crops, with the hope that a knowledge of why certain operations are effective in increasing plant growth, will enable farmers further to improve their methods of cultivation, with more profits to themselves, and greater prosperity to the State, still I can hardly close without some brief reference to local practices.

In increasing the supply of air in the soil, deep ploughing, with the great increase in soil bulk which follows it, naturally allows of the admittance of the maximum amount of air, but in our particular conditions, other considerations must be taken into account, and we find in many parts of South Australia that great difficulty is experienced in packing the soil, after it has been ripped up deeply with the plough. Because of this trouble of creating a good seed-bed in many soils ploughed deeply, it is in most cases wiser in this State, to plough to only a comparatively shallow depth, and to aerate the land by much shallow working.

As with air for the soil, deep ploughing will admit more water than will shallow ploughing, but as this is not always a wise practice, as has just been pointed out, it is better to break up the land sooner than would otherwise be necessary, so that it is longer in the rough state to collect all the rain that falls.

For the conservation of as much water as is possible, the land must be cultivated in some way every time that a crust forms on its surface, and as the creation of the seed-bed must always be considered, no cultivation should be deeper than is absolutely necessary. If the land is free from weeds, and there is no danger of the soil readily running together if worked down fine, harrows will often break a crust, and when this is so there is nothing to be gained by using a heavier implement. When light implements will do the cultivating job, they should be used, because they not only save draught, but they rarely do damage to the seed-bed which is being prepared.

If the soil is cultivated every time that it is necessary from a moisture-conserving point of view, and when weeds are in evidence, mineral plant food will be liberated and the activities of the soil bacteria will be encouraged.

Weeds should always be destroyed by cultivation, while they are still small, then shallow work will be all that is necessary, but if for

any reason they are allowed to make much growth, the implements put on the land to kill them, will naturally have to be worked at a greater depth than is good for the seed-bed. The bad effects of deep cultivation to kill summer weeds, should be corrected by packing the land with a roller, if rain does not soon follow the deep cultivation, and as a rolled surface leads to loss of soil moisture, this implement should always be followed by a cultivator of some sort, such as harrows or a spring-tooth cultivator, to loosen up the immediate surface soil.

As all soil tillage should finish up by leaving a good seed-bed, other than for ploughing, shallow cultivation should be practised whenever a soil working is necessary. If there is any fear that the soil is too loose for best results, the land should be packed with a roller of some sort, before the seed is put in.

In present conditions we can certainly grow profitable crops in much of this State, when the land receives plenty of cultivation, finishing up with a good seed-bed, and the more intelligent work given to the land, and the firmer the under layers of the soil at seeding time, the greater will be the returns secured, from all crops seeded directly into the field.

Mr. F. G. Bonin (Pinnaroo) congratulated Mr. Spafford on what he, the speaker, considered to be one of the finest papers that had ever been submitted to an Agricultural Congress. The paper if properly digested by the farmers of the State should have a very far reaching effect on the production of wheat. Mr. A. E. Milne (Tatiara) asked whether the writer of the paper considered it would be advisable to use the plough on land that had been ploughed last year, but had had to be left out on account of the prolonged rain. Mr. Spafford stated that implement should be used which would do the job in the cheapest possible manner. If the land was not too heavily covered with weeds a set tyne cultivator should do the work, whilst if the land was of a sandy character the harrows should be able to do a good job. Mr. O. Forbes (Yadnarie) also congratulated Mr. Spafford on the excellence of his paper. Farming was quickly becoming a science and it behoved every farmer to make a careful study of the nature of the soils of his holding. Mr. A. M. Fuller (Tarlee) stated that he also had an area of land which, owing to the continued wet weather, he had not been able to get under crop. He had found it necessary again to plough the land, but he was working the soil as shallow as possible. He asked whether some of the losses could be regained by sowing Sudan grass for fodder and cutting the crop for hay, and what was the feeding value of Sudan grass. Mr. Spafford said that in Mr. Fuller's case the idea was one that was certainly well worth while putting into practice, because as a rule the district of Tarlee received summer rains. Where summer rainfall was only scanty, he would not advise putting the suggestion into practice. Sudan grass was very close in feeding value to wheaten hay, and it was more palatable than the cereal hay, but the sowing of Sudan grass would very materially affect the crop that was sown on the same land in the succeeding year. Mr. H. Paech (Black-

heath) asked if stinkwort had any deleterious effect on the crop of wheat sown the following year, to which Mr. Spafford replied that stinkwort had no ill effect on the following crop, unless the growth of stinkwort was very heavy, and did not thoroughly decompose after the land had been fallowed, thereby causing hollows in the land. Mr. E. Hunt (Morphett Vale) desired to know whether sheep could be used instead of a roller for consolidating the soil. "Yes," said Mr. Spafford, "if you can use the sheep in flocks of thousands and drive them backwards and forwards over the fallow; sheep as you all know soon make tracks going to and from drinking." If the sheep could be made to pack the soil like they did at a gateway, then he would say use them by all means. Mr. H. T. Torr (Redhill) asked whether Mr. Spafford would recommend the use of the sub-packer. South Australians, said Mr. Spafford, could show the Americans how to work land. The Americans were not good soil workers under low rainfall conditions, and they produced very few crops on land receiving under 15in. annual rain. South Australia had plenty of farmers making a good living on land that did not receive 10in. of rain per year. Messrs. W. Haynes (Georgetown), J. Darley (Narriby), and A. Jarvis (Berri) also referred in eulogistic terms to the valuable and comprehensive paper that Mr. Spafford had read to the gathering.

Wednesday Afternoon.

CONSERVATION OF FODDER ON THE FARM.

Mr. A. L. Molineux (Tarlee Branch), opened the proceedings by reading the following paper on this subject:—

To my mind one of the most vital questions the farmer has to face is—how best to conserve in times of plenty for the lean years that are sure to come. For this sunny land of ours, in some districts at least, is a land of feast and famine to a certain extent. We well know that if we have plenty of fodder this year the time of shortage may not be far away, and to be successful we must make provision for years when fodder is scarce. There are various ways of doing this. We can, when we get a heavy crop, cut more hay than we require and stack it for future use. This method has its disadvantages in the fact that mice play havoc with the stacks, although if cut green the loss by this means is not so severe. Still it is considerable, and further, the stock do not relish the mice infested hay. There is another disadvantage in this method, and it is one that the average farmer must take into consideration. In thus cutting into your grain crop for future use, you are also cutting into your year's income very considerably, and this, of course, is a grave matter to a man with limited capital. Then, even if we did cut for future use we are only human, and should the chaff merchant make us an offer of £5 a ton, we would probably sell and trust to Providence for the future, forgetting the fact that Providence helps only those who help themselves.

There is another method of conserving fodder which is deserving of notice. It is the conserving of grain in bulk, either oats or barley. Both these grains have a very high feeding value, and a comparatively small space is needed to store them in bulk. A small galvanized iron shed with a concrete floor would make a very reasonable granary; a shed 12 feet by 6 feet and 6 feet high would hold 100 bags in bulk. This method has one enemy and that is the weevil pest, which would make the holding of this grain for long periods an impossibility. Two years would be about the limit that grain could be kept in reasonable condition for economic feeding by this method. The weevil do not appear to affect the grain in any manner detrimental to stock. In my experience weevilly grain put through the crusher and fed to stock is taken quite readily by them. The only fault is the loss of feeding value caused by the weevil eating out the centre of the grain.

There is still another method of conserving fodder which, I venture to say, is deserving of the greatest publicity and which, to my mind, is invaluable to the farmer. I refer to cutting a portion of the crop and threshing it by means of a threshing plant. Of course I do not advocate treating the whole crop in this way, for in this sunny land of ours the quickest, cheapest, and most effective method of harvesting grain is by the combined harvester and its kindred machines; but I would strongly advise every farmer to cut a small portion of his crop and treat it in this manner. The resulting fodder is a great benefit to the stock. Horses and cattle do well on it, and in the time between the giving out of the stubble feed and the coming of the green feed it fills a big gap. It does away with the necessity for feeding hay to the young stock and cattle, which is a saving both of hay and work. Stock eat the fodder readily and keep their condition very well. If a stack of it could be placed conveniently close to the stable in a small paddock and the working horses allowed to have the free run of it after their last feed at night, they would appreciate the freedom and make good use of their stack as a dessert after their meal, as a shelter, and a bedding place. The horses would be in much better condition than if left tied up or shut in a stable yard. If there came a time of failure of crops, one of these stacks of threshed straw would be chaffed up, and with the addition of a small amount of grain, preferably crushed oats, the horse teams would be able to get through the seeding and fallowing without any undue hardship, and the farmer would not have to pay high prices for chaff to keep his teams at work. I admit that the task of chaffing the straw would not be a pleasant one; still it can be done, and in such circumstances would pay well.

Now we come to the important question, what varieties to cut for threshing? I would give first preference to oats for the following reasons:—Oats are always a tricky crop to harvest, and the loss by shedding by wind must amount to thousands of bags annually in the State. This loss is almost wholly eliminated by the method of cutting and threshing. No doubt most of you have had this bitter experience of losing the bulk of your oat crop by wind. My neighbor this year lost over four bags per acre in one windy day. My own oat crop being

already in the stooks was not affected by the wind. This alone meant a saving to me of nearly double the amount it cost to thresh the piece. So it paid well.

With regard to wheat varieties most suitable for threshing for fodder, the best are those in which the sugar contents of the straw are high. You will probably be surprised to hear that King's White and Le Huguenot are both excellent varieties for the purpose in view. The general idea is that these varieties are too hard and harsh in the straw, but cut in the right stage and passed through the thresher which pulverises the straw, the resultant stack is highly relished by the stock. Crossbred 53 is another good variety, and there are many others which yield splendid fodder; varieties such as Queen Fan, Onas and Federation are not of much value. If you do not care to cut into your wheat crop, there is always the barley crop; and here, as is the case with oats, you eliminate the risk of loss by wind, and although barley straw has not the same feeding value as other straw, still, in times of need it can prove very acceptable indeed to any class of stock, and they eat it readily. The quantity to cut and thresh depends upon your needs; if you put up one stack every year you should have enough on hand to see you through any time of stress. I find that two to three bales of string make a handy size stack: 12 yards by 10 yards or 12 by 12 yards is a very nice size to handle; a smaller stack has always a tendency to fall, and we found it paid to build up this size.

There are two points in building the stack to which I must draw your attention. Always put your elevator on the lee side of the stack. The reason for this is that any waste grain or husk and the finer particles of chaff are always found under or near the elevator, and the stock naturally eat their way into the stack from that side. Another point to keep in mind is to put your stack as high as possible; this will mean better protection from the weather, and the stack will not fall so easily when the stock eat their way under it. The thresher will deliver the straw and chaff separately if required, but for fodder purposes it pays better to run both together into the one stack.

Now we come to the question of cost. As a fair example, let us take the patch of oats we threshed this year; area, 23 acres; variety, Algerian; sown, 20th May; cut as straw turned color; twine used, two bales; estimated weight of stuff put through, 66 tons; oats cleaned, 966 bushels; time required, 3½ days, including setting up and dismantling plant, a few minor repairs, and fifteen minutes' travelling time each day. We worked under award rates and hours, not farmers' hours. Men required, eight—two in paddock, two on stack, and four at thresher. We found this the most economical team for a thresher of this capacity. Fewer men means harder work and less put through per day. Tonnage per day, 20; bags per day, 110. I would like to point out here that as fodder is the end in view, it is only tonnage that matters. If you want a big average of bags per day, take out your harvester and get them with that. Cost, including hire of engine and thresher, 8½d. per bushel, or approximately 12/3 per ton. Yield per acre, 42 bushels.

In conclusion, I would like to emphasize these points as the essentials of success. Cut your stuff at the right stage. Make your stack as high as possible and let it settle before turning the stock to it. A good plan is to keep the stock out until the nights begin to turn chilly, the stack will by that time have settled sufficiently. Cut only varieties yielding good fodder. A layer of straw over the stack will protect it from the weather, although this is not absolutely essential, as the rain does not appear to penetrate far, providing the stack is well built. A light sprinkling of salt would enhance the feeding value of the fodder. Do not keep your stacks on from year to year till half your farm is covered with them; use them—that is what they are for—use not ornament.

DISCUSSION.

Mr. J. Gray (Claypan Bore) thought the estimate of 12s. 3d. per ton was very low, he estimated it cost 15s. to cart the straw and put it in the stack. He would build a strong post and rail fence around the stack to protect it from the animals, because he found they trampled on the straw without eating it when it was not protected. Mr. B. Cornish (Gumeracha) was in favor of stacking the straw. He said if the butts were placed on the outside with the sheaves straight, and the stack was thatched properly and built away from posts, that would help considerably in keeping out the mice because they entered the stack from either the top or the bottom. Mr. Torr (Redhill) advised farmers to co-operate when purchasing thrashing plants because they were expensive. Mr. H. Davis (Pinnaroo) said the farmers did not do justice to the conservation of fodder; on his farm he stacked as much as 50 tons per year. This year's stack would be carried over until next year, when another would be built. The varieties most suitable for stacking, he thought, were Le Huguenot and King's White. He made a practice of putting a small quantity of each over the fence each night for the stock. Mr. H. Jericho (Yadnarie) emphasised the importance of keeping only the best animals. He found that when timber was used as a foundation for the stacks the mice could gain an entry, so he used straw and secured much better results. Mr. W. H. Lang (Virginia) recommended the round stacks, and deprecated the practice of conserving the hay in sheds.

DAIRYING.

Mr. H. J. Apps (Government Dairy Assistant), then delivered an address on Dairying.

FREE PARLIAMENT.

The following resolutions were carried by the Congress:—(a) "That Branch members, travelling to the Winter School at Roseworthy Agricultural College, should be granted railway tickets at excursion rates." Mover, Mr. S. Ockley (Penola); seconder, Mr. W. A. Clifford (Penola). (b) "That the Education Department be asked to alter the date of the Michaelmas holidays to synchronise with show week,

so that country children might have an opportunity of attending the show." Mover, Mr. W. A. Clifford (Penola); seconder, Mr. S. Ockley (Penola). (c) "That it is desirable that legislation to provide for the compulsory registration of stallions should be introduced." Mover, Mr. M. P. Wilkin (Coomandook); seconder, Mr. W. H. Cuming (Strathalbyn). (d) "That in view of the importance of the wool industry to the State the Government be asked to appoint one or more wool instructors to be attached to the Department of Agriculture." Mover, Mr. N. S. Lillierapp (Morehard); seconder, Mr. H. Robertson (Orroroo). (e) "That the necessary action be taken to prevent the destruction of timber on all roads of the State." Mover, Mr. H. Howard (Petina); seconder, Mr. E. Pitman (Wirrabara). (f) "That the Government be urged to evolve some scheme for planting trees on all suitable travelling stock roads and reserves." Mover, Mr. A. Badman (Yaaka); seconder, Mr. C. Rieks (Cherry Gardens). (g) "That the plant known as "horehound" be proclaimed a noxious weed." Mover, Mr. J. H. Sargent (Gladstone); seconder, Mr. J. T. Bergin (Gladstone). (h) "That the Government be asked to enforce the regulations dealing with the compulsory spraying of orchards." Mover, Mr. C. Rieks (Cherry Gardens); seconder, Mr. W. H. Giles (Milang). (i) "That this Congress supports the Chamber of Commerce in its recent recommendation that the Chapman sack filled with grain be accepted by all handling agents regardless of weight." Mover, Mr. F. Pitman (Coomalpyne); seconder, Mr. A. E. Clarke (Crystal Brook). (j) "That all cornsacks in the same bale be made the same size." Mover, Mr. A. C. Greig (Maramba); seconder, Mr. N. Sanders (Nunkeri and Yurgo). (k) "This Branch protests against the action of the Adelaide Steamship Company in raising the freights and fares on vessels trading between Spencer's Gulf ports." Mover, Mr. F. L. Johnson (Wudinna); seconder, Mr. D. B. Butler (Butler). (l) "That all motor cars and motor vehicles be registered in the district in which the owners reside and that the money be retained by the district councils for the repair of the roads in the same district." Mover, J. S. Hammatt (Lyndoch); seconder, Mr. M. P. Wilkin (Coomandook). (m) "That in the opinion of Congress the Fertilisers Act should be amended in such a manner as to require the guarantees to indicate the phosphoric acid content instead of the tricalcic content." Mover, Mr. J. R. Beck (Wynarka); seconder, Mr. A. Nash (Shoal Bay). (n) "That the Government be asked to expedite the allotment of dry blocks in the irrigation areas to overcome the shortage of wood supplies for settlers use." Mover, Mr. S. J. Randell (Lone Gum and Monash); seconder, Mr. E. R. Whitelaw (Lone Gum and Monash). (o) "That the position of Mallee Lands Instructor be filled." Mover, Mr. H. Howard (Petina); seconder, Mr. N. Sanders (Nunkeri and Yurgo). (p) "That dried fruit be carried on the railways at the same rate as fresh fruit." Mover, Mr. A. G. Milner (Waikerie); seconder, Mr. J. J. Odgers (Rameo). (q) "That instead of one-third of the members who are lowest in attendance at the meetings of the Branch being struck off the roll, only members who have failed to attend a certain

percentage, say, 5 per cent., of the meetings, be struck off at the annual revision of the roll." Mover, Mr. B. Cornish (Gumeracha). (r)
"That this Branch urges on the Government the necessity for destroying noxious weeds on railway lines and Crown lands in the whole of the State." Mover, Mr. C. Williams (Minnipa); seconder, Mr. Hannigan (Wilmington). (s) "That the Government be asked to fix a standard for all spraying compounds, and that the manufacturers be required to conform to same." Mover, Mr. G. Brown (Williamstown); seconder, Mr. R. G. Morphet (Kangarilla).



ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Monday, September 10th, there being present Capt. S. A. White (Vice-Chairman), Professor Arthur J. Perkins (Director of Agriculture), Messrs. A. M. Dawkins, C. J. Tuckwell, and F. Coleman. Apologies were received from Messrs. H. Wicks and W. J. Colebatch.

Reappointment of Members.—Captain S. A. White, Colonel Rowell, Messrs. A. M. Dawkins, G. Jeffrey, W. S. Kelly, and W. G. Auld were appointed members the Advisory Board of Agriculture, by the Hon. the Minister of Agriculture, for a further period of two years.

Importation of Stud Stock from Great Britain.—A communication was received from the Prime Minister intimating that shipping companies had decided to reduce the freight on stud cattle between the United Kingdom and Australia to 40 guineas, and on sheep to 11 guineas each, the arrangement to be operative for a period of 12 months. The Secretary was instructed to obtain information from New Zealand regarding the conditions under which stud stock were imported from Great Britain.

Travelling Citriculturist and Viticulturist for River Murray.—At the recent Conference of River Murray Branches it was decided to ask the Government to appoint a travelling citriculturist and viticulturist for the River Murray districts. The matter was referred to the Chairman of the Irrigation Commission, who reported that Mr. W. E. Muspratt was appointed to carry out the duties referred to in the resolution. The Commission hoped to be able to relieve Mr. Muspratt from other duties which had prevented him from giving sufficient time to instructional work, and there would then be no need for the appointment of an additional officer.

Transmission of Cancer from Stock to Human Beings.—A resolution asking for a report on the possibility of transmitting cancer from stock to human beings was carried at the Conference of Upper Northern Branches. The matter was referred to the Chief Inspector of Stock (Mr. C. A. Loxton, B.V.Sc.), who reported that there was no possibility of man becoming affected with cancer by eating meat from the carcass of an animal so affected, or through contact with such an animal.

Delays in Railway Transit of Stock.—The Upper Northern Branches Conference also resolved "That the Advisory Board be asked to approach the Railways Commissioner, with reference to the delay in the carriage of stock on the railways." The Chief Railways Commissioner (Mr. W. A. Webb) to whom the resolution was submitted reported,—"Until the removal of the engine depot from Islington to Mile End, some three months ago, most of the livestock and goods trains finished at Dry Creek. This meant that at times, to small consignments of livestock consigned to Adelaide, a delay occurred at Dry Creek until a train was available to move the livestock from that station to Mile End, but in such cases the persons ordering the vans were informed of the probable delay at Dry Creek so that arrangements could be made to feed and water their stock. Since then, how-

over, all livestock and goods trains finish at Mile End, and stock for Mile End and south thereof reach Mile End without the delay at Dry Creek."

Soil Surveys of Irrigated Land.—The Conference of River Murray Branches carried a resolution to the effect that before any land was thrown open for irrigation purposes a thorough soil survey should be made. The Chairman of the Irrigation Commission, to whom the matter was referred, stated that the Commission was fully aware of the importance of a soil survey prior to land being opened for irrigation, and would act accordingly.

Request for Draught Stallion.—The Kybybolite Branch requested that the Department of Agriculture be asked to station a good draught stallion at the Kybybolite Experimental Farm. The Board decided to refer the matter to the Director of Agriculture for a report.

Wheat Certificates.—Members were of the opinion that matters relating to wheat certificates being held by firms in payment of debts did not come within the scope of the Board. The Secretary was instructed to advise the Cungena Branch accordingly.

Bird Pests.—The Cherry Gardens Branch asked that a bounty be paid for the heads of Rosella and Blue Mountain parrots and starlings. It was decided that Captain White should visit the Branch and discuss the proposal.

Resolutions Carried at Southern Conference.—(a) "That the Government be requested to conserve the waters of the Finnis and Angus Rivers for irrigation purposes." The Board decided to transmit the matter to the Minister for his information. (b) "That the Stock and Brands Department be asked to enforce strictly the provisions of the Stock Diseases Act." It was decided to refer the resolution to the Chief Inspector of Stock. (c) "That the Advisory Board be asked to approach the Railways Commissioner, with the request that a moveable partition be provided in the trucks now used for the carriage of pigs and calves in the one truck." The Secretary was instructed to submit the resolution to the Railways Commissioner, with a request for a report on the matter.

Resolution from Lameroo Conference.—(1) "That the Advisory Board be asked to request the Government to offer a bonus for the eradication of take-all." On the suggestion of the Director of Agriculture, the Secretary was instructed to advise the Minister that whilst it did not support the resolution, members believed it would be desirable for the Vegetable Pathologist to supply regular progress reports of his investigations into the take-all disease. (2) "That this Conference desires the formation of a library of agricultural literature for the Branches of the Agriculture Bureau." The Secretary was instructed to formulate a scheme whereby the request of the Conference could be granted, and furnish a report at the next meeting of the Board.

Date of Next Meeting.—It was decided that the next meeting of the Board should be held on Tuesday, October 9th.

Life Members.—The names of Messrs. G. Holder (Watervale Branch) and J. H. Sargent (Gladstone Branch) were added to the Roll of Life Members of the Agricultural Bureau.

New Branches.—Approval was given for the formation of Branches of the Agricultural Bureau at Wookata, Bethel, McLaren Flat, and Pinnaroo (Women's). The following are the foundation members of the above Branches:—Wookata—F. E., T. F., S., B., and C. Gurney, E. J., A. J., and C. D. Oats, H. V. Hobbs, F. M. Underwood, J. H. Murray, F. C. Tomney, C. T. and R. N. Giles, J. Bastian, L. E. and R. Hardy, L. Walker; Bethel—T. H. and F. H. Gene, H. and R. Peltz, H. Linke, B. Winter, J. Dacke, H. and E. Vogt, F. Schmidt; McLaren's Flat—S., O., and R. Steer, F. Liddiard, J. Collins, R. B. Ottewell, F. and V. Bell, S., C., and G. Ward, E. S. Hockney, E. G. and J. E. Gill, T., E., P., S., and R. Elliott, F. and L. Townsend, N., F., and R. Low, H. Whiting G., A., E., and W. Hobbs, J. Knight, E. Brookman, G. Grant, W. Maidment, W. and H. Osmond, A. Crowder, J. Truscott, W. H. Rau, H. Elliott, R. Thorpe, R. J. and E. M. Trott, H. and K. Sauerbier, H. Powell, N. Charlton, W. Ashby, C. F. Schuller, C. Oakley, J. McPhie, A. Wickham, E. S. Bagshaw, C. Beale, C. Baxter, M. Gibson, F. R. Bruce, F. B. Wilson, K. Whiting, R., P., and W. Wait, G. Rowe, P. Penny, J. Ward, J. Mills, W. and J. Sigston, R. and W. Q. Nottange, G. Connor, C. Goldfinch. —Williams, L. Hussey, L. Weber, E. and C. Wickham, S. C. Thomas, S. Ledger; Pinnaroo (Women's)—Mesdames H. H. Withers, A. Jordan, E. H. Leak, M. C. Symonds, H. Kirby, B. Edwards, H. Ledger, W. Muirhead, J. E. Symonds, F. Docking, A. Bennett, A. B. and P. H. Jones, McNeil, C. Lynch, Misses McDonough, Leach, L. Bennett, L. Casson, S. Klinger, C. M. Bennett, V. Jones, I. Fuller, E. Fuller, E. Leak, G. Gurridge, J. McKenzie, R. Casson, K. O'Loughlin, K. Kelly.

Branch to be Closed.—It was decided to close the Coorabie Branch.

New Members.—The following names were added to the rolls of the existing Branches:—Narridy—S. Freeman, E. G. Wright, O. Smart; Darke's Peak—J. Howard; Miltalie—P. Cranswick; Mount Shank —H. Habner, D. MacCuspin; Butler—E. J. Ferguson, C. C. F. Parker, V. A. Parker; Koppio—H. G. Meadows; Lone Pine—W. Schmaal; Wareowie—H. Jarvis, L. Jarvis; Kangarilla—S. Steer; Saddleworth (Women's)—Mrs. J. L. Severin, Mrs. J. Jamieson, Miss Scovell, Miss H. Coleman, Miss E. Frost, Miss J. C. Colebatch; North Booborowie—H. Dawson; Parilla—R. C. Kerley, —Venning; Wudinna—J. Woods, F. A. Miller, B. R. Bennell; Renmark—R. G. W. Lane; Tarlee—E. A. Luscombe; Pompootea—A. Hayward, L. Pettman; Eurelia—G. Wheadon, A. S. McPhee, A. Poldon, E. L. Bray, O. Schmidt; Berri—C. O. Scott; Watervale—F. Grace, jun., Chas. Grace; Kalangadoo (Women's)—Mrs. E. Dowdell, Mrs. N. McCall, Miss E. McCall; Yallunda—G. Olstan; North Booborowie—W. L. Brown; Amyton—E. G. Cook, W. H. Alsop, E. A. Thomas; Strathalbyn—C. H. Dunn, Rev. T. P. Wood, K. Harris; Rapid Bay—B. Willis, V. R. Chirgwin, C. Chirgwin, L. Morris, J. Morris, H. Jones; Block E—H. MacRae, R. Nenke, N. A. Buckenara, P. Muspratt, A. Heard, C. D. Davenport, F. Hayercraft, O. Jungfer, G. Lacey, P. Smith, F. W. Fairweather, R. W. Civil, D. MacPhee, G. E. Brown, L. A. White; Paskeville—J. Petherick, L. Koch; Shoal Bay—D. Bell, K. Bates; Balhannah—A. James; Williamstown—S. Antwiss, F.

Gangel; Lenswood and Forest Range—P. Brown; Coomandook—A. S. Chapman, H. Chapman, N. McArdle, G. Ninnis, W. Saint, L. Brown; Brinkley—A. E. Burzacott; Tatiara—E. J. Buckley, Thos. Marshall; Netherton—A. S. Winton, H. N. Davis, J. A. Johncock; Monarto South—S. J. Harper; Collie—W. Hood; Big Swamp—R. Telfer; Elbow Hill—F. W. Ramsey; New Residence—H. Glatz; Claypan Bore—A. J. Millard; Cungena—W. Linquist, C. E. Feltus; Winkie—W. H. Swinstead, C. F. Brown; Two Wells—J. Cowan, J. H. Rowe; Lake Wangary—L. Fraser; Williamstown (Women's)—Mrs. A. Rowe, Mrs. J. Lane; Yadnarie—W. Hoffman, O. Hoffman, G. Dreckow; Rapid Bay—G. Stacey, R. Chambers, A. Bennett; Rockwood—W. T. Curnuck; Owen—J. F. W. Williams, W. F. Rogers, G. V. Barrett; Penola—J. Bott, G. Thompson; Morehard—H. Fulliek; Coonalpyn—G. Vile; C. George, C. T. George, A. George, J. Brown, G. Gibbs, F. Russell, M. Young; Renmark—A. Robertson, L. Bennett, P. Johns; Talia—P. Fraser; Hookina—P. Fraser; Wepowie—F. W. Chureher, A. E. Matthews; Kongorong—N. Elliot; Mount Hope—D. Doudle, D. Speed, D. Myers, N. Ness, R. Speed, D. Wollaston, J. Phillips; Parilla Well—A. J. L. Guthleben, R. L. Hammond, R. F. Inglis.

THE AGRICULTURAL OUTLOOK.

REPORTS FOR THE MONTH OF SEPTEMBER.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

Kybybolite.—Weather—The comparatively warm, dry conditions of late August continued for the first week of September. Since the 10th instant, however, rain has fallen practically every day, and very rough, boisterous weather has been experienced. Over 4in. rain have been registered for the month, an inch and a quarter above the average, and nearly 21in. have fallen for the year. Crops, with a few exceptions, are promising very poor. Barley and peas sown in August have germinated well. Some fallowing has been done, but land is now again too wet for working. Natural feed has received a check during these late squalls.

Eyre Peninsula.—Weather—There have been 132 points of rain for the month. Needless to say, this has been very beneficial to all crops. The weather has not been so rough as is usually the case in September, and in addition to this the good rains have more than counteracted what bad weather there has been. All crops are looking remarkably well. There is promise of some very heavy oat yields this year. Hay crops are assured, and there should be some quite good hay yields. Natural feed has made splendid growth this year. Stock—All in tip top condition and free from disease. Miscellaneous—Some of the neighboring farmers have some exceptionally early crops, and should be able to commence haymaking within a few days.

Turretfield.—Weather—This month has been exceptionally wet, the rainfall has been 412 points, floods have done much damage. Crops—The crops are very poor; a few have made a little improvement, but many have gone back, and give a very poor prospect for the coming harvest. Natural feed is not too plentiful, and like the crops, is suffering from excessive rainfall. Stock—In fair condition, but need finer weather to improve, the wet having held them back. Miscellaneous—A large area of last years' fallow has been reploughed again this year, and farmers are hoping to gain in crop yields next year.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on October 1st, 1923:—

BUTTER.—The cold boisterous weather experienced during the month has had the effect of making the flush of the season some weeks later than usual. However, big quantities of butter are being marketed, and find good sales interstate, whilst the London buyers have also been more in evidence. Since our last report values of top grades have improved to the extent of 1½d. per lb., and a firming is also recorded in the lower grades. Choicest factory and creamery fresh butter in bulk, 1s. 5½d.; second grades, 1s. 4d. to 1s. 4½d.; best separators and dairies, 1s. 4d. to 1s. 5d.; fair quality, 1s. 3d. to 1s. 3½d.; store and collectors, 1s. 1d. to 1s. 2½d., according to quality.

EGGS.—Large quantities were marketed at each auction held, but were readily cleared by the strong demand which exists with interstate and local buyers, rates at the close of the month being fresh hen, 10½d.; duck, 11½d. per dozen.

CHEESE.—The values in this line have remained practically stationery, and although large parcels have been consigned from the South-Eastern factories, all coming forward have been readily absorbed by the good local and fair interstate sales, at the range of 1s. 2d. to 1s. 3d. for large to loaf.

HONEY.—In this State large quantities of all grades are being held in stock, as difficulty is being experienced in effecting sales; the interstate orders have only been for small parcels. During the month business has been put through at the following rates:—Prime clear extracted, in liquid condition, 3½d. to 4d.; best candied lots, 3½d. to 3½d.; lower grades from 2d. to 2½d., according to quality; beeswax readily saleable at 1s. 3½d. to 1s. 4d. for clear samples.

ALMONDS.—An improved demand exists for all classes of almonds, and consignments are meeting with ready quittance at slightly better values. Brandis, 16d.; mixed softshells, 9d. to 9½d.; hardshells, 4½d.; kernels, 1s. 4½. to 1s. 5d.; walnuts, 1s.

BACON.—An advance in price took place since our last report, as curers have not had large supplies of the live hog to operate on at the various markets. However, the sales have not been affected by the higher prices, for brisk demand rules. Best factory cured sides, 1s. 3½d.; hams, 1s. 6d. to 1s. 6½d.; middles, 1s. 5d.; rolls, 1s. 1½d.; Hutton's "Pineapple" brand lard in packets, 1s. 1d.; in bulk, 1s.

LIVE POULTRY.—Fairly extensive catalogues were offered during the month. Buyers, however, have apparently disposed of their stocks on hand and exhibited keenness in purchasing their requirements, with the result that all consignments coming forward were readily cleared. We expect that these good rates will continue to be obtained for some markets to come, and strongly advise consignments (crates obtainable on application). Values at the close of the month were as under:—Prime roosters, 5s. to 7s. 6d. each; nice condition cockerels, 3s. 9d. to 4s. 9d.; poor condition cockerels, 3s. to 3s. 3d.; plump hens, 4s. 9d. to 6s.; medium hens, 3s. 8d. to 4s. 6d.; some pens of weedy sorts lower; geese, 7s. to 8s.; ducks, good condition, 5s. to 7s. 4d.; ducks, fair condition, 3s. 1d. to 4s. 9d.; turkeys, good to prime condition, 1s. 1d. to 1s. 6½d. per lb. live weight; turkeys, fair condition, 9d. to 1s.; fattening sorts lower; pigeons, 1s. 4d. each.

POTATOES.—During the month a good steady demand was experienced for best Victorian potatoes, which realised 16s. 6d. to 17s. per cwt. on trucks, Mile End.

ONIONS.—Best Mount Gambier dry onions selling at 7s. 6d. to 8s. per cwt. on trucks.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.**IMPORTS.***Interstate.*

Apples (bushels)	11,429
Bananas (bushels)	8,706
Oranges (bushels)	16
Passion fruit (bushels)	515
Pears (bushels)	40
Pincapples (bushels)	761
Tomatoes (bushels)	46
Beans (packages)	3
Carrots (packages)	100
Onions (bags)	1,197
Potatoes (bags)	16,592
Swedes (packages)	901
Bulbs (packages)	20
Plants (packages)	16
Seeds (packages)	59
Trees (packages)	15
Wine casks, empty (number)	3,772

Fumigated—15 packages trees, 37 wine casks.

Rejected—448 second-hand bags, 6bush. tomatoes.

*Overseas.***Federal Quarantine Act.**

2,246 packages seeds, etc.

EXPORTS.**Federal Commerce Act.**

50 packages fresh fruit, 2,972 packages citrus fruit, 22,101 packages dried fruit, 15 packages preserved fruit, and 3 packages plants were exported to overseas markets. These were consigned as follows:—

London.

Dried fruit (packages)	17,544
Oranges (packages)	80

New Zealand.

Citrus fruit (packages)	2,888
Dried fruit (packages)	2,349
Plants (packages)	3

India and East.

Dried fruit (packages)	242
Preserved fruit (packages)	15
Oranges (packages)	4
Apples (packages)	50

South Africa.

Dried fruit (packages)	1,365
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France.

Dried fruit (packages)	1
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Vancouver.

Dried fruit (packages)	600
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RIVER MURRAY HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1923.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during August.	Per Cow during August.	Per Cow October to August.	Per Herd during August.	Per Cow during August.	Per Cow October to August.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/C	30-71	24-84	26317	856-95	8183-46	984-90	32-07	325-5
1/E	21-26	20-26	11980-5	563-52	6226-68	516-85	24-31	274-6
1/J	22	19	10101-5	459-16	5630-76	453-82	20-63	257-9
1/L	18	12	10493-5	582-97	6129-15	440-51	24-47	280-6
1/M	23	16-87	7741	336-56	5332-48	414-35	18-02	267-5
1/R	15-81	11-81	8490-5	537-03	5399-50	366-12	23-16	268-7
1/T	12	11-03	7580	631-66	5897-85	386-55	32-21	297-10
1/U	13-48	12-26	10095-5	748-93	7262-98	431-18	31-99	313-1
1/W	19	17-77	14148-5	744-06	6856-55	492-81	25-94	257-3
1/X	18	12-29	9118-5	506-58	5899-37	334-16	18-56	259-4
1/Y	24	18	15500	645-83	6817-69	609-58	25-40	290-6
1/Z	20	15-77	12086-5	604-33	5641-27	501-66	25-83	252-4
*1/AA	7	6	2852	407-43	6589-93	141-02	20-15	295-0
*1/BB	7-19	6-94	4171-5	580-18	5492-38	189-86	26-41	242-5
†1/CC	17	17	10788	634-59	4183-58	452-63	26-63	178-6
†1/V	14	14	6138	438-43	3958-78	294-72	21-05	177-3
Means	17-65	14-74	10475-16	593-39	6382-89	438-17	24-82	280-4

* Entered Association November 1st, 1922.

† Entered Association December 1st, 1922.

‡ Entered Association February 1st, 1923.

COWS YIELDING 1,000 GALLS. OF MILK OR 400 LBS. OF BUTTERFAT DURING A LACTATION PERIOD.

Name of Cow.	Owner.	No. of Days.	Milk, Gallons.	Butterfat, Lbs.
Pimple	C. J. Morris, Monteith	319	1020-45	454-50
Princess Royal	C. J. Morris, Monteith	268	1342-00	451-79

MOUNT GAMBIER AND DISTRICT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1923.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.	
			Per Herd during August.	Per Cow during August.	Per Herd during August.	Per Cow during August.
			Lbs.	Lbs.	Lbs.	Lbs.
2 A	20	9-74	7272	363-60	267-49	13-37
2 B	7-39	6-03	5956	805-95	196-45	26-58
2 C	18	16-10	9041-5	502-31	319-92	17-77
2 E	15	9-94	6228	415-20	250-35	16-69
2 F	21-65	21-06	12219-5	567-03	487-07	22-60
2 H	24	16-77	11307-5	471-15	413-51	17-23
2 I	12	6-42	4822	401-83	181-12	15-09
2 J	10	7-45	5909	590-90	209-69	20-97
2 K	21	14-06	8531	406-24	330-43	15-73
2 L	29-23	16-19	6608	226-07	282-20	9-65
2 O	35	25-13	16116-5	460-47	558-14	15-95
2 R	16	13-71	14200	887-50	548-33	34-27
2 S	5	4-32	3295	659-00	151-17	30-23
2 T	11	7	7378	670-73	302-35	27-49
2 U	16	8-71	8203	512-69	303-68	18-98
2 V	17	15-81	5547-5	326-32	256-74	15-10
2 W	11	11	9966-5	906-05	332-39	30-22
2 X	15	11-06	7538-5	502-57	274-18	18-28
2 Y	11	8-06	6555	595-91	171-32	24-67
2 Z	14	14	9393	670-93	379-81	27-13
2 Aa	22	12-19	6690	304-09	271-77	12-35
2 Ba	9	8-04	4940-5	548-94	169-21	18-80
2 Ca	12	11-32	4887	407-25	194-88	16-24
Means	16-18	11-96	7939-35	490-65	302-27	18-68

COWS YIELDING 1,000 GALLS. OF MILK OR 400 LBS. OF BUTTERFAT DURING A LACTATION PERIOD.

Name of Cow.	Owner.	No. of Days.	Milk.	Butterfat.
			Gallons.	Lbs.
Rosie	E. W. Tollner, Mount Gambier ..	299	952-35	480-26

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall of the subjoined stations for the month of and to the end of September, 1923, also the average precipitation to the end of September, and the average annual rainfall.

Station.	For Sept., 1923.	To end Sept., 1923.	Av'ge. to end Sept.	Av'ge. Annual Rainfall	Station.	For Sept., 1923.	To end Sept., 1923.	Av'ge. to end Sept.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta	—	1.92	3.88	4.93	Spalding	2.47	13.09	15.98	20.4
Marree	—	3.56	4.48	6.14	Gulnare	2.82	15.86	15.25	15.4
Farina	0.01	5.16	5.12	6.73	Yacka	2.32	12.88	12.39	15.6
Copley	0.01	5.38	6.58	8.50	Koolunga	2.24	12.49	12.68	15.8
Beltana	0.04	5.93	6.93	9.65	Snowtown	2.56	12.46	12.99	16.4
Blinman	0.18	7.93	9.93	12.61	Brinkworth	2.36	13.77	12.98	16.4
Tarcoola	0.05	2.49	5.93	7.91	Blyth	2.33	14.91	13.52	16.4
Hookina	0.32	7.79	10.50	13.60	Clare	4.20	25.28	20.05	24.5
Hawker	0.54	10.50	10.21	12.93	Mintaro	5.00	26.84	19.09	23.4
Wilson	0.70	9.20	9.87	12.56	Watervale	4.22	25.73	22.53	27.4
Gordon	0.67	6.46	8.92	11.60	Anburn	4.45	22.01	19.75	24.4
Quorn	1.37	11.00	11.29	14.24	Hoyleton	2.83	14.36	14.25	15.4
Port Augusta	0.41	5.87	7.53	9.68	Balaklava	2.47	13.07	12.86	15.6
Port Augusta West	0.41	5.54	7.65	9.74	Port Wakefield	1.71	10.93	10.79	13.4
Bruce	0.69	6.41	8.23	10.76	Terowie	1.52	9.54	10.55	13.3
Hammond	0.86	10.01	10.24	11.90	Yarcowie	1.63	9.09	11.13	14.4
Wilmington	1.61	15.23	14.79	18.44	Hallett	2.61	14.20	12.89	16.4
Willowie	1.20	10.51	9.89	12.44	Mount Bryan	3.41	17.67	13.38	16.4
Melrose	2.12	22.08	18.01	23.88	Koorunga	2.96	13.92	14.56	18.4
Booleroo Centre	1.86	15.14	12.10	15.67	Farrell's Flat	3.41	17.99	15.35	18.4
Port Germein	1.18	10.03	10.08	12.93					
Wirrabara	2.47	17.20	15.88	19.85	WEST OF MURRAY RANGE.				
Appila	1.98	13.09	11.71	15.01	Manoora	3.84	20.01	14.97	18.4
Craddock	0.62	8.29	8.94	11.50	Saddleworth	3.48	19.00	15.86	19.4
Carrieton	0.89	10.80	10.00	12.91	Marrabel	3.79	23.68	15.85	19.4
Johnburg	1.05	7.72	8.26	10.85	Riverton	3.93	24.18	16.71	20.4
Eurelia	1.02	10.46	10.58	13.56	Tarlee	4.08	23.42	14.22	17.4
Orroroo	1.30	9.81	10.77	13.75	Stockport	3.57	21.74	13.68	16.4
Nackara	0.51	5.92	9.45	11.85	Hamley Bridge	3.45	21.02	13.19	16.4
Black Rock	1.22	11.97	9.90	12.73	Kapunda	4.38	22.13	15.92	19.4
Ucoita	0.60	6.18	9.46	12.10	Freeling	3.85	21.65	14.25	17.4
Peterborough	1.39	12.47	10.44	13.53	Greenock	4.92	26.63	16.24	21.4
Yongala	1.82	12.20	11.27	14.51	Truro	4.57	23.58	16.19	20.4
					Stockwell	4.43	24.25	16.20	20.4
LOWER NORTH-EAST					Nuriootpa	4.35	22.91	16.84	20.4
Yunta	0.25	3.81	6.59	8.93	Angaston	4.45	25.96	18.10	22.4
Waukaringa	0.22	4.69	6.62	8.61	Tanunda	4.95	26.82	17.99	22.4
Mannahill	0.37	4.25	6.11	8.79	Lyndoch	6.68	34.36	18.60	22.4
Cockburn	0.07	4.07	6.29	8.42	Williamstown	6.94	34.57	22.61	24.4
Broken Hill, N.S.W.	0.26	6.57	7.57	10.08					
LOWER NORTH.					ADELAIDE PLAINS.				
Port Pirie	1.19	9.20	10.73	13.55	Mallala	3.75	20.15	13.01	18.4
Port Broughton	2.41	12.23	10.60	14.27	Roseworthy	4.65	22.10	13.82	17.4
Bute	2.92	14.76	12.85	15.80	Gawler	4.39	22.20	15.40	19.4
Laura	2.44	16.79	14.52	18.25	Two Wells	3.62	18.74	12.79	15.4
Caltowie	2.14	15.49	13.46	17.19	Virginia	4.17	21.38	13.91	17.4
Jamestown	2.93	17.28	14.02	17.86	Smithfield	4.60	23.89	13.70	17.4
Bundaleer W. Wks.	3.12	16.61	14.19	18.05	Salisbury	5.80	26.10	12.71	18.4
Gladstone	2.69	18.66	12.79	16.22	North Adelaide	7.03	27.85	18.11	22.4
Crystal Brook	2.30	13.58	12.63	15.93	Adelaide	5.83	24.38	17.20	20.4
Georgetown	2.38	18.02	14.81	18.50	Glenelg	5.86	20.15	15.11	18.4
Narridy	1.65	12.83	14.17	16.43	Brighton	5.53	22.99	17.39	21.4
Redhill	2.43	13.62	14.80	16.93	Mitcham	6.08	29.34	20.82	24.4
					Glen Osmond	7.23	32.72	21.23	25.4
					Magill	7.37	33.55	20.75	25.4

RAINFALL—continued.

Station.	For Sept., 1923.	To end Sept., 1923.	Av'ge. to end Sept.	Av'ge. Annual Rainfall	Station.	For Sept., 1923.	To end Sept., 1923.	Av'ge. to end Sept.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGERS.					WEST OF SPENCER'S GULF—continued.				
Tree Gully.....	6-06	36-43	22-50	27-65	Talia.....	1-92	14-51	12-95	16-45
Ring West.....	10-39	55-23	38-84	46-59	Port Elliston.....	1-87	17-02	14-24	16-55
Adala.....	6-95	36-19	27-37	32-98	Cummins.....	3-28	18-52	15-83	18-90
rendon.....	5-51	24-31	18-68	22-79	Port Lincoln.....	3-20	17-17	16-75	19-72
phett Vale.....	4-58	23-56	17-92	20-35	Tumby.....	2-49	10-75	11-68	14-76
arlunga.....	5-55	27-39	21-56	25-89	Carrow.....	2-04	10-06	11-17	14-18
lunga.....	4-49	20-65	17-12	20-35	Arno Bay.....	1-84	10-01	10-46	13-30
linga.....	4-99	28-96	24-76	29-16	Cowell.....	1-56	6-54	9-40	11-75
ponga.....	4-81	23-74	18-29	20-61	YORKE PENINSULA.				
manville.....	4-39	26-90	19-60	23-10	Walleroo.....	2-39	12-23	11-68	14-18
akalilla.....	7-52	35-35	22-47	27-16	Kadina.....	2-67	14-88	13-29	16-05
unt Pleasant.....	7-05	37-04	24-16	29-33	Moonta.....	2-72	13-78	12-68	15-38
dwod.....	8-22	44-40	24-73	33-29	Green's Plains.....	2-81	16-21	13-06	18-89
meracha.....	8-64	45-81	—	—	Maitland.....	4-56	22-44	16-65	20-15
Brook Reservoir	9-27	45-60	29-64	35-55	Androssan.....	3-24	14-73	11-59	14-11
ale.....	8-14	38-14	29-61	32-11	Port Victoria.....	3-92	18-21	11-86	15-47
oside.....	8-75	42-03	28-64	34-67	Curramulka.....	3-74	18-29	14-96	18-22
bleside.....	5-95	29-91	23-38	28-42	Minlaton.....	4-03	20-88	14-85	17-91
rne.....	7-46	38-44	25-72	31-18	Brentwood.....	3-55	17-80	12-81	15-83
unt Barker.....	7-26	40-10	27-30	32-96	Stansbury.....	4-64	19-88	13-98	17-04
lunga.....	7-07	32-90	25-07	30-57	Warooka.....	4-87	23-00	15-03	17-81
celesfield.....	7-90	39-64	29-65	36-04	Yorketown.....	4-24	19-01	14-67	17-26
olows.....	3-70	16-62	15-75	19-32	Edithburgh.....	6-02	19-35	13-71	16-58
athalbyn.....	—	—	—	—	SOUTH AND SOUTH-EAST.				
MURRAY FLATS AND VALLEY.					Cape Borda.....	2-77	22-75	21-74	25-10
ingie.....	3-21	19-34	15-37	18-66	Kingscote.....	3-07	19-53	16-05	19-10
ong.....	2-45	12-52	14-49	15-40	Penneshaw.....	2-77	15-58	15-82	19-39
horne's Creek.....	2-61	14-12	11-65	14-61	Victor Harbor.....	3-03	18-74	17-69	21-45
linton.....	3-24	12-87	11-61	14-77	Port Elliot.....	2-96	18-13	17-57	20-26
Mem Bend.....	3-58	14-18	11-42	14-55	Goolwa.....	1-80	14-30	14-66	17-87
urray Bridge.....	2-61	11-31	10-99	13-93	Pinnaroo.....	2-68	15-24	12-23	15-66
linton.....	3-11	14-75	12-46	15-42	Parilla.....	3-02	14-62	11-35	14-65
nnum.....	2-55	9-26	9-33	11-64	Lameroo.....	3-73	16-77	12-66	16-37
lmer.....	3-38	14-91	12-38	15-47	Parrakie.....	2-76	14-42	11-35	14-54
an.....	3-01	12-39	9-89	12-29	Geranium.....	3-17	15-97	13-09	16-19
an Beach.....	1-85	9-02	8-54	11-09	Peake.....	3-50	14-88	13-27	16-58
anchetown.....	0-72	4-78	7-78	10-16	Cooke's Plains.....	4-89	17-64	12-02	15-04
unda.....	2-13	14-95	12-90	17-54	Coomandook.....	3-13	14-45	13-99	17-48
herlands.....	1-81	10-18	8-62	11-19	Coonalpyn.....	3-46	17-63	13-88	17-42
rgan.....	0-93	6-21	6-94	9-30	Tintinara.....	3-19	19-40	14-78	18-40
ikerie.....	1-13	6-31	7-41	9-91	Keith.....	3-46	17-86	14-40	18-17
erland Corner.....	0-90	5-63	8-32	11-07	Bordertown.....	3-34	17-94	15-24	19-44
nton.....	1-76	9-16	10-01	12-63	Wolseley.....	3-42	19-43	14-37	18-12
mark.....	1-01	6-86	9-22	11-09	Frances.....	3-58	20-00	15-26	19-78
ash.....	1-01	7-59	—	—	Naracoorte.....	3-56	21-39	17-51	22-52
WEST OF SPENCER'S GULF.					Penola.....	4-35	23-59	21-03	26-29
la.....	0-42	4-79	8-53	10-02	Lucindale.....	2-92	21-90	18-78	22-95
ite Well.....	0-39	4-51	7-18	9-08	Kingston.....	2-33	21-18	20-99	24-47
ler's Bay.....	0-87	11-32	10-39	12-16	Robe.....	1-80	21-75	20-86	24-59
pong.....	2-13	11-76	10-63	12-49	Beachport.....	2-39	20-38	23-09	20-24
luna.....	0-92	8-99	8-26	10-36	Millicent.....	3-46	23-75	24-58	29-36
oky Bay.....	0-97	12-30	9-11	—	Kalangadoo.....	4-79	30-81	—	—
ina.....	2-07	12-83	10-78	13-34	Mount Gambier.....	3-76	24-62	25-15	31-24
sky Bay.....	1-42	13-53	13-05	15-10					

AGRICULTURAL BUREAU REPORTS.

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Alawoona	*	—	—	Gladstone	†	19	23
Aldinga	*	24	26	Glencoe	†	—	—
Allandale East	314	26	23	Glossop	*	24	21
Amyton	282	22	26	Goode	*	24	21
Angaston	*	—	—	Green Patch	299	22	19
Appila-Yarrowie	*	—	—	Gumeracha	*	22	26
Arthurlton	*	—	—	Halidon	308	24, 27	24
Ashbourne	313	—	—	Hartley	†	24	21
Balaklava	*	13	10	Hawker	†	23	26
Balhannah	†	19	23	Hilltown	*	—	—
Barmera	†	22	19	Hookina	†	25	22
Beetaloo Valley	*	—	—	Inman Valley	*	—	—
Belalie North	*	20	17	Ironbank	310	20	17
Berri	308	24	21	Kadina	*	—	—
Big Swamp	305	—	—	Kalangadoo (Women's)	316	13	10
Blackheath	A.M.	26	23	Kalangadoo	315	13	10
Black Springs	287	—	—	Kangarilla	310	—	—
Blackwood	†	15	19	Kanmantoo	*	20	17
Block E	308	—	—	Keith	*	—	—
Blyth	†	6	3	Ki Ki	*	—	—
Booleroo Centre	†	19	23	Kilkerran	294	25	22
Borrika	†	27	24	Kimba	*	—	—
Brentwood	*	25	22	Kingscote	*	—	—
Brinkley	*	20	17	Kingston-on-Murray	*	—	—
Bundaleer Springs	*	22	—	Kongorong	†	22	19
Bute	*	23	20	Koonibba	†	19	23
Butler	†	—	—	Koppio	†	22	19
Calca	*	—	—	Kybybolite	*	25	22
Cadell	*	—	—	Lake Wangary	300	20	17
Canowie Belt	*	—	—	Lameroo	*	26	23
Carrow	†	25	21	Laura	†	27	24
Cherry Gardens	313	23	20	Lenswood and Forest Range	312	—	—
Clanfield	*	—	—	Light's Pass	*	25	22
Clare	*	19	—	Lipeon	†	20	—
Clarendon	*	22	19	Lone Gum and Monash	†	24	21
Claypan Bore	306	24	21	Lone Pine	*	—	—
Cleve	*	24	21	Longwood	†	—	—
Collie	305	27	—	Loxton	*	—	—
Colton	*	26	30	Lucindale	*	—	—
Coomandook	308	24	21	Lyndoch	288	25	22
Coonalpyn	†	26	23	McLachlan	†	6	3
Cradock	*	—	—	McLaren Flat	†	—	—
Crystal Brook	287	19	17	MacGillivray	†	23	20
Cungena	†	—	—	Maitland	*	25	22
Currency Creek	†	26	23	Mallala	*	15	19
Cygnat River	†	25	22	Maltee	*	19	23
Darke's Peak	†	6	14	Mangalo	*	—	—
Denial Bay	*	—	—	Mannanarie	†	—	—
Edillilie	*	27	24	Marama	306	22	22
Elbow Hill	298	30	27	Meadows	*	24	21
Eurelia	282	19	16	Meningie	*	—	—
Farrell's Flat	†	19	23	Milang	313	13	10
Frances	*	27	24	Millicent	†	6	3
Gawler River	*	22	26	Miltalie	†	20	17
Georgetown	*	20	17	Mindarie	*	1	5
Geranium	*	27	24				

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Minlaton	*	19	23	Rockwood	311	22	19
Minnipa	*	24	21	Rosedale	†	—	—
Monarto South	307	—	—	Rosy Pine	†	—	—
Moonta	†	19	23	Saddleworth	288	—	—
Moorak	316	25	22	S a d d l e w o r t h	*	9	13
Moorlands	*	—	—	(Women's)			
Moorook	308	26	22	Salisbury	290	2	6
Morchard	282	20	17	Salt Creek	*	—	—
Morphett Vale	313	26	22	Sandalwood	*	—	—
Mount Barker	†	24	21	Shoal Bay	†	23	20
Mount Bryan	*	—	—	Smoky Bay	302	—	—
Mount Bryan East ..	*	—	—	Spalding	*	—	—
Mount Compass	*	—	—	Stockport	*	—	—
Mount Gambier	†	13	10	Streaky Bay	*	—	—
Mount Hope	†	20	17	Strathalbyn	*	23	20
Mount Pleasant	314	—	—	Talia	†	8	12
Mount Remarkable ..	*	—	—	Tantanoola	†	20	17
Mount Schank	*	23	20	Taplan	A.M.	23	20
Mundalla	*	24	21	Tarcowie	286-7	23	20
Murray Bridge	308	16	20	Tarlee	290	16	—
Mypolonga	†	22	19	Tatiana	316	20	17
Myponga	*	—	—	Tweedvale	*	—	—
Myrta	*	20	17	Two Wells	294	—	—
Nantawarra	*	25	22	Uraidla & Summertown	*	1	6
Naracoorte	†	13	10	Veitch	*	—	—
Narriby	*	27	24	Virginia	*	—	—
Narrung	314	27	24	Waikerie	*	—	—
Neeta	*	—	—	Wall	*	—	—
Nelshaby	*	20	17	Wanbi	*	—	—
Netherton	308	19	—	Warcowie	282	—	—
North Booborowie ..	286	23	—	Watervale	294	—	—
North Bundaleer	*	—	—	Weavers	296	22	19
Northfield	*	—	—	Wepowie	†	23	20
Nunkeri and Yurgo ..	*	7	4	White-Yarcowie	†	—	—
O'Loughlin	299	24	21	Wilkawatt	308	20	18
Orroroo	A.M.	20	24	Williamstown	*	3	—
Owen	294	19	23	(Women's)			
Parilla	308	19	23	Williamstown	294	19	23
Parilla Well	†	22	26	Willowie	†	24	21
Parrakie	*	—	—	Wilmington	†	24	21
Paruna	*	—	—	Windsor	†	23	—
Paskeville	298	19	23	Winkie	308	22	19
Pata	*	—	—	Wirrabara	*	20	17
Penola	†	6	3	Wirrega	*	—	—
Petina	†	27	24	Wirrilla	*	26	17
Pinnaroo	*	26	1	Wirrulla	†	20	17
Pompoota	*	10	14	Wolowa	*	—	—
Port Broughton	*	19	23	Wudinna	†	20	17
Port Elliot	314	17	21	Wynarka	†	—	—
Port Germein	*	27	24	Yabmana	*	—	—
Pygery	*	20	21	Yacka	*	23	20
Ramco	†	22	19	Yadnarie	305	23	20
Rapid Bay	312, 314	6	3	Yallunda Flat	302	—	—
Redhill	287	23	—	Yaninee	*	—	—
Kendelsham	*	24	21	Yeelanna	306	20	17
Renmark	†	25	22	Yongala Vale	*	—	—
Riverton	*	—	—	Yorketown	*	—	—
Riverton (Women's) ..	*	—	—	Younghusband	†	25	22
Roberts and Verran ..	301	26	22				

* No report received during the month of September. † Held over until next month. ‡ Formal.
A.M. Annual meeting.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

EURELIA.

August 18th.—Present: 13 members.

CULTIVATOR v. PLOUGH FOR FALLOWING.—In the course of a paper dealing with this subject, Mr. E. H. Hall first referred to the time that was saved where a cultivator instead of a plough was used for fallowing. In such cases an eight-horse team was able to work a 13-tine cultivator which turned over 8ft. 6in. of land, but the same team working a five-furrowed plough would only turn over a strip of land 3ft. 4in. in width. He advocated working the cultivator at a depth of 3in. The cultivator made a good job of pulverising the soil, which caused a good germination of weed seeds. The speaker was of the opinion that a farmer working a cultivator would be able to fallow 300 acres of land whilst the man using the plough would only be able to deal with 200 acres. In the discussion that followed, Mr. Brown favored the plough, because that implement made a better seed bed than the cultivator. Mr. Page said he had observed the method of fallowing adopted by Mr. Hall for a number of years, and he had now come to the conclusion that the cultivator was the better implement to use. An interesting report on the growing of Hubam clover was given by Mr. Page.

MORCHARD (Average annual rainfall, 13.50in.).

August 25th.—Present: 16 members and five visitors.

FARM HANDS AND FARM LABOR.—Mr. P. C. Schultz, who read a paper under this heading, was of the opinion that the securing of suitable labor was becoming a very serious question to the farmer. He also thought that the farmer would be compelled to pay higher wages for a shorter working day. The young men and immigrants at present working on the farms should be taught to do their work more quickly and to adopt better methods of going about the work. Every encouragement should be given to the young men to remain on the land, and should they make mistakes, they should be corrected in a kindly manner. The young man in the city had many advantages over the youth in the country, and farmers who employed young men should bear that point in mind, and remember that the man that they treated with respect would be the man from whom they would obtain the best work. Mr. C. Halliday read an article dealing with the determination of the age of sheep by their teeth. An interesting report was also given of the recent trial of tractors, held under the auspices of the Whyte-Yarowie Agricultural Bureau.

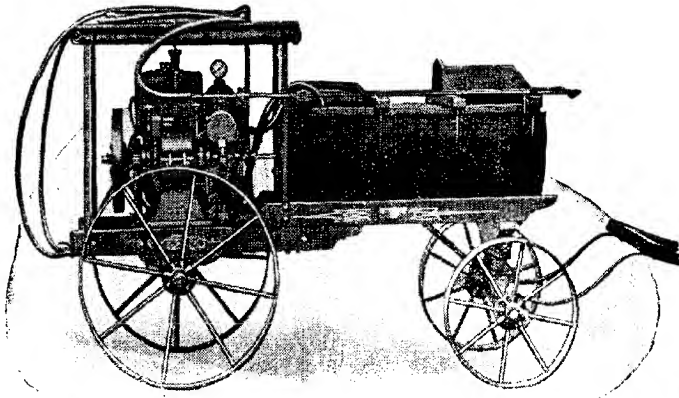
AMYTON, August 20th.—The meeting discussed the subject, "The Importance of Country Roads." The Hon. Secretary (Mr. L. N. Mills) presented the Annual Report, and the officers were elected for the ensuing year.

WARCOWIE, August 24th.—Mr. A. Telfer delivered an address, "Classification of the Farmer's Clip," and gave a demonstration of woolclassing. An interesting discussion followed. The annual meeting of the Branch was held on August 2nd, when the officers were elected for the ensuing term.

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MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

CRYSTAL BROOK (Average annual rainfall, 15.62in.

August 24th.—Present: 17 members.

ECONOMICAL PROBLEMS IN FARMING.—A paper was contributed by the Hon. Secretary (Mr. H. K. Lock). After having discussed the effects which the shortage of farm laborers had had on the farming practices of the State, Mr. Lock continued:—"With the cutting up of large estates for closer settlement, and the consequent high prices ruling for land, the farmer must of necessity obtain greater returns off smaller areas. To do this, he has improved his methods of farming to such an extent that it is now practically a science. Every care is taken in cultivation, seeding and reaping to obtain the greatest returns. The advent of superphosphate and other artificial manures has enhanced the farmers' returns, and with modern machinery and implements, it is possible to handle a 400 to 600 acre farm on his own and ensure a good livelihood. This necessitates a rotation of bare fallow and wheat, with no land lying idle. By this method a farmer gains a good return for his labor, but necessarily lowers the cropping value of his soil, not so appreciably, however, as before the advent of artificial manures. On a farm of this size it is possible to work it with one good team of horses and big implements, the farmer then being independent of labor. The continuous cropping of the land has led in some districts to dispensing with the plough and using in its place a disc or tyne cultivator. This is contingent on the nature of the soil to be worked and the time of the year such cultivation is to be done. It is obvious, however, on land that is inclined to run together and is hard, there is only one implement, the plough, to break it up for cultivation. The other method may, however, be cheaper and just as efficient in certain districts. Then the scarifier and tyne cultivator is being replaced by the large spring tyne cultivator, the contention being, that land worked over three times with the spring tyne cultivator is preferable to land worked only one or twice with the ordinary cultivator. This again is contingent on the soil and the time of the year the work has to be done, but it makes possible the cultivation of large areas of land at little cost, with one team of horses. Again, at seed time the combined drill and cultivator is replacing the ordinary drill and cultivator with marked success, both from the point of view of efficiency and saving of time and labor. A 10-horse team on a 17 to 20 tyne combine can do more and make a better job than two teams on separate implements, at a saving in expense of one man and a number of horses. Furthermore, it is claimed by many users of the "combine" that better returns are obtained. In the matter of harvesting machinery there is a marked improvement. The bigger combs and improved threshing machinery have made it possible to harvest almost any crop expeditiously and with very little waste. A farmer to-day equipped with a modern 8ft. or 9ft. thresher can comfortably handle a 300-acre crop. This was impossible with the old types of machines. It is seen, therefore, that a farmer to-day can be independent of labor. I do not say it is wise to avoid employing labor, for it would be false economy if a farmer were to avoid employing labor, and by doing so have hundreds of bags of wheat damaged by weather because they had not been sewn and carted. On the price of wheat that has been ruling, there is a reasonable margin of security, but should the price fall to pre-war level, that is round about 3s. 6d. per bushel, a farmer is on doubtful security, and every care must be taken to handle the produce at an absolute minimum. In some districts the price of wheat does not affect the farmer so much as he handles his crop as hay, but in this district it is only exceptional conditions that would necessitate having to cut the crops for hay. In cases where the crops contain abundance of rubbish, or where a crop is showing signs of imperfection, such as heads breaking off, &c., then the farmer has no option but to cut his crop of hay and, incidentally, to take just what the chaff merchants care to offer. It seems to me than in semi-dry areas, such as the middle-north and the drier mallee districts, where the scarcity of rain results in a very small development of straw, it is false economy to grow wheat for hay other than to meet one's own needs. I go so far as to say that a farmer is sacrificing his return by so doing on the present price of wheat. Take, for instance, last season. Some hundreds of tons of hay were delivered to chaff merchants in this district at £2 10s. per ton. The crops would not probably have averaged more than 30cwt.

to the acre, being a return of £3 5s. per acre. To harvest this crop and deliver the hay to the mills entails heavy labor, the hay having to be cut, stooked, and carted. On the other hand the crops cut would have yielded between six and eight bags of wheat per acre,—say, seven at 5s. per bushel would bring a return of £5 5s., labor entailed being less—reaping, sewing, and carting. Even if labor were equal it would still show a balance of £2 per acre in favor of wheat. This does not apply where a farmer has no alternative but to cut his crop for hay, but it shows the fallacy of trying to market a crop as hay in districts where there is not a sufficient rainfall to ensure prolific growth of straw. This is more pronounced in districts where new land has to be worked, and where the average return is less than, say, five bags per acre. In such districts where the rough conditions of the paddocks and the scanty growth means cutting large areas to provide sufficient hay for the following year, mechanical haulage is a great boon. In certain areas of the State the water problem is a great drawback, and when an exceptionally long summer is experienced it is a difficulty to keep even sufficient stock for the needs of the settler. In such circumstances there is no doubt that the tractor will eventually supersede the horse team to a large extent, and in many cases be the salvation of many farms which to-day are practically useless. Even in the more settled areas, keen interest is being manifested in the advance of various types of mechanical haulage. Many of those who have purchased tractors have had good results with them, whilst others have not. As to whether they will successfully replace horse teams or even work in conjunction with them has yet to be proved. First of all there is the type used; secondly, the man who uses it; thirdly, the conditions under which it is used; and fourthly, the amount of abuse that it receives. There are those who even go so far as to say that tractors will never be a success. There were those who scoffed at the use of artificial manures. The trouble is simply this, we have always relied on horses for farm work, and have reckoned on our problems in horses, and it is therefore impossible for many farmers to overcome that condition and think mechanically; due, naturally, to the fact that they know all about horses and nothing about tractors. The time is within our knowledge when motor cars were a novelty. To-day hardly a farm is without one, and no one would gainsay that the car is a universal convenience and a necessity in many cases. So it is with the tractor. No one would give up his car and take on a four-in-hand coach as a matter of preference or convenience, and so the time will come when few will care to forego their tractors and take on a 8 or 10 horse team. I wish to place before you a few simple facts concerning tractors in preference to horses. You are all familiar with the drudgery of farming in relation to the incessant labor and tediousness in regard to team work, and the enormous annual expense in horse feed. In passing, let me remark on the latter. Two well-to-do farmers in this district informed me that one who crops between 400 and 500 acres annually pays away £500 in horse feed. The other considered his feeding cost at least £600. The ruling price for contract work in this district is approximately 7s. 6d. for ploughing, 1s. 6d. for cultivating, and 6d. for harrowing. My experience with a tractor works out at ploughing 2s. 1d., cultivating 7d., and harrowing 2½d. Add labor to these figures and they are considerably less than half, besides which the tractor costs nothing when idle. There is of course, the relative depreciation between the tractor and the horse team, which is contingent on many circumstances, and it is difficult to obtain an estimate. For instance, one man would drive his tractor successfully for ten years, whilst the same tractor in the hands of another man would not run for three years. One must be prepared to write off a certain amount of depreciation and allow for breakages, but on the other hand, horses do not live for ever, and a farmer must always have nine to ten horses to keep an eight-horse team going, and at the same time be prepared to loose one or more every year. Nor does the horse labor include the overtime every farmer spends in feeding up and other attentions. Summing up, the position is that with efficient mechanical haulage, a farmer is able to obviate much of the drudgery, at the same time be more independent of labor and able to work his land far more cheaply than at present. There is also a further factor, and that is that an efficient tractor has more scope, for not only do they travel faster, but are capable of doing more continuous work. Instead of being able to work 300 acres per year with an eight-horse team, one is able with a tractor of equivalent strength to do half again as much. There must, however, be a period of trial through which

the tractor must pass. There are many imperfections in the various types at present on the market and many difficulties have to be overcome before their use is universal. A few points that one must take into consideration in choosing a tractor are flexibility, simplicity in construction, efficient haulage power, economy in operation, and durability. There is also the matter of finance, for however well a farmer may work his property, if he does not buy and sell well then he is not successful. Summing up, a farmer should obtain the greatest returns from his land, in the cheapest manner with up-to-date machinery, and know how best to dispose of his goods when he obtains them.'

NORTH BOOBOROWIE (Average annual rainfall, 16.35in.).

August 21st.—Present: six members.

THE BOY ON THE FARM.—Mr. R. Dawson read a paper dealing with this subject. In spite of the good wages that could be obtained by farm hands, he said it was a difficult matter to induce young men to leave the city and go out to work on a farm. If the lad were successful in obtaining employment with a good farmer, work on the land had many advantages over city life. In the first place, good wages could be earned and the living expenses were not nearly so heavy. A good lad should receive every encouragement from the farmer to stay on the land. The boy would be certain to make mistakes, and the farmer should correct the lad in a kindly manner. The sensible lad would realise that during the busy seasons of the year it was not convenient to have afternoons off for sport and recreation, but during the slack times of the year the lad should be given time off to indulge in cricket, football, shooting, or some other form of recreation. The lad should be allowed to keep a horse on the farm, and if he did not have one, his employer should be willing to allow him the use of a saddle-hack. Mr. F. Clark, in opening the discussion, considered it would be a good plan to advertise the advantages of farm life in the city schools. Mr. R. Griel said many farmers made the mistake of expecting the boy to perform as much work as a grown man. If the boys were to be kept on the land, it was imperative that the farmers should exercise patience and teach them the best methods of doing the work in connection with the successful management of the holding.

TARCOWIE (Average annual rainfall, about 15½in.).

July 24th.—Present: 19 members and three visitors.

FARM TRACTORS.—Mr. W. S. Ninnies, in the course of a paper dealing with this subject, said since the year 1914 remarkable strides had been made in the progress of agricultural tractors, until at the present time the tractor could be worked under almost any condition, driven as easily as a motor car, and worked more economically than a team of horses. The writer, however, was of the opinion that the time had not yet arrived when the horse could be entirely dispensed with on the farm, but the farmer who employed two or more teams of horses could, with advantage, dispose of all the horses except one team and purchase a 20 horsepower tractor. The stationary engine that was used for chaff cutting, wood sawing, &c., could also be sold, and the tractor engine used in its stead. An average year's work for a team of 10 horses (valued at £25 per head, £250) would be to fallow, harrow, cultivate, sow, and reap 250 acres. In doing that, and allowing that the horses would be running in the paddock for two months, they would have consumed about 50 tons of chaff, which, at the present price, £5 per ton, would mean £250, or £1 per acre. That amount of work could be done more cheaply with a tractor. Fallowing at 3s. per acre, £37 10s.; harrowing at 1s. per acre, £12 10s.; drilling at 1s. per acre, £12 10s.; reaping at 2s. 6d. per acre, £31 5s.; interest on £500 at 6 per cent., being difference in cost of tractor and team, £30; making a total of £130—a balance in favor of the tractor of £120. If necessary the tractor would be capable of getting over a far greater area. Another point in favor of the tractor was that one did not have to feed up after tea, or get up early in the morning to feed and groom the team, nor walk about in a dirty yard putting on harness. A tractor would work almost continuously throughout the day, while the horses had to be fed and rested. After heavy rain, one would have to wait perhaps a couple of days longer before starting with the tractor than with the horses. Such loss of time, however, could easily be made up by working long shifts, or at night, if necessary. The fallow would also be in better order after an extra day or two in which to allow the excessive moisture to soak away. In

the next few years he believed that it would be proved that fallowing could be done more easily, more cheaply, and more quickly with the tractor than it could with horses.

REDHILL, August 24th.—The Wool Instructor of the School of Mines (Mr. A. H. Codrington) attended the meeting and gave a woolelassing demonstration and address to a gathering of 17 members and five visitors.

TARCOWIE.—A meeting was held on August 21st, when papers dealing with the subjects "The Blowfly Pest" and "Useful Hints" were read from the *Journal of Agriculture*. An interesting discussion followed, in which Messrs. W. S. Ninnes, J. Ninnes, G. Watkins, and O. W. Davidson took part.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLACK SPRINGS.

July 26th.—Present: 17 members.

THE FARMER AND HIS SONS.—In the course of a paper under this title, Mr. O. Mann expressed the opinion that when the lad left school he should be given some tangible interest in the working of the farm. For instance, the young man should be given, say, five bags of wheat out of every hundred produced on the farm, and that amount could be increased every year. That would encourage the lad in his work, and make him more careful, because he would realise that the better he worked the land the more wheat would be produced, and he would benefit accordingly. The father should not allow his son to squander the money, but sufficient pocket money should be given to the lad, and the remainder could be banked. The speaker also thought that before any new implements were purchased the father should take his son into confidence, and discuss the merits and demerits of the various implements, so that the most suitable might be purchased. On the other hand, if the lad showed no inclination to work on the farm, and no liking for the work, he should be allowed to learn a trade.

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LYNDOCH (Average annual rainfall, 23.01in.).

August 23rd.—Present: 18 members.

VITICULTURE.—In the course of an address dealing with this subject, Mr. J. G. Kelly first dealt with the question, "What to Plant." The speaker said he would not suggest any one or more varieties of vines to intending planters. He advised the planter to find out the varieties grown in his neighbourhood, and to be guided by the varieties that had thus been tried and proved successful. **Distances to Plant.**—Mr. Kelly was strongly in favor of close planting. He gave instances, together with yields per acre, of close planting. He favored 16ft. by 4ft. **Trellis v. Bush.**—For the majority of varieties he favored trellising. He had found larger crops and better fruit on the trellis, with the added advantage in cultivation. **Fertilisers.**—The speaker was strongly in favor of liberal applications of manures. If stable manure were available, it should be carted direct from the stables and spread on the land. If the ground were heavy, a liberal supply of lime would prove most beneficial. Mineral superphosphate was an essential manure. **Application.**—After ploughing, lime should be placed on the surface of the land and then worked in with the harrows. Most manures should be ploughed or drilled in deeply, early in the winter. Sulphate of ammonia, however, should be applied at a shallow depth early in the spring. The speaker strongly advocated experiments with various fertilisers, because that was the only method by which the grower could be certain that he was applying the manure that was most suited to his class of soil. **Cultivation.**—The first ploughing should be done in the winter, and a crown formed in the centre of the row. The second ploughing should be done in the spring, the soil being ploughed towards the vine, and the cultivator used frequently well into the summer. A fine tilth should be kept on the surface of the soil to conserve as much moisture as far into the summer as possible. **Pruning.**—Certain practices were essential, according to the vigour or weakness of the individual vine. Pruning could be simplified if time were taken to dis-bud water shoots, &c., early in the season. The speaker strongly deprecated the practice of "topping." It weakened the vine and lessened the coming crop. It was a mistake to turn stock into the vineyard whilst there was any green color showing on the leaves. Mr. Kelly also gave much interesting information of his experiences in the vineyards of Italy and France.

SADDLEWORTH (Average annual rainfall, 19.69in.)

July 27th.

BREEDING AND REARING FAT LAMBS.—The following paper was read by Mr. C. Pellew:—"In the breeding and rearing of fat lambs on the farm, the first and main point to decide is what breed of ram and ewe should be mated to give the most profitable lamb. There is no doubt that the Merino ewe is best suited for this district, because the value of its fleece far outweighs the advantages of a Lincoln-Merino or Leicester-Merino half-bred ewe, namely, better mothering qualities and capacity to throw a larger framed and more quickly maturing lamb, especially as the half-bred or crossbred is more difficult to obtain and has no respect for fences. In the case of the ram, the fleece is of minor importance on account of the small number required on the farm—one to every 40 to 50 ewes—and the qualities that are aimed at are early maturity and a large and well proportioned frame. The rams chiefly used at present are the Southdown, Shropshire, Leicester, Dorset Horn, and Merino, and in respect to the two main points mentioned above, I should place the Dorset Horn first. The lamb produced from this cross grows a big frame, is shapely, and matures very quickly; in fact, dropped at the same time and on the same pasture, I should say a four months old Dorset Horn-Merino lamb would be quite as heavy as a five months old Merino, especially if dropped late, or in cold weather. The rams can be put in the flock at one or more day intervals any time after the beginning of November, and may be left in from three to six weeks, depending on the number of rams used. If put in too early, there is always the risk of a shortage of succulent food at lambing time. On the other hand if the rams are put in early in November the lambs will be dropped early in April, and as that time of the year is generally warm, there will not be such heavy losses from cold weather and foxes. The ewes should be crutched in February or March in order to minimise trouble from flies during lambing, care of course being taken not to throw the ewes about too violently while the cleaning up is in progress. To give the best results, the ewes should be in good condition, but

not fat, when lambing is due, and plenty of water should be available, especially if the sheep are on dry feed. With the Dorset Horn, in common with other large-headed rams, the tendency is to throw a large-headed lamb, hence there is a danger of trouble with the ewes when lambing. In my short experience, however, the trouble so caused has been practically nil. If possible, lambing should take place somewhere handy to the homestead, and the flock should be visited at least twice a day in case a lambing ewe needs assistance. Frequent visits to the flock will save many lambs, especially from crows and hawks, both of which kill numbers of lambs by pecking their eyes out soon after the lambs are born. Foxes also are a great source of annoyance and loss. The only remedy for this pest seems to be constant and organised poisoning by means of baits. The lambs should be tailed when not more than four weeks old, preferably about two, and in the case of males they should be castrated at the same time. The knife is in my opinion better than the searing iron, more particularly if the lambs are tailed when young, and very little check in growth should then take place. Naturally, the better the feed the quicker will be the growth of the lambs, and most farmers, I am afraid, rely too much on natural pasture to fatten the lambs. When it is realised that forage crops such as rape, barley, peas, and rye give many times the quantity of feed that natural pasture does, it is surprising that these crops are not more largely grown for feed on land that is lying out. Not only can we extract higher returns per acre from forage crops, but the soil is greatly improved for the succeeding wheat crop, on account of the larger amount of organic matter deposited in the soil by the sheep. Speaking generally, lambs should be ready for market at from four to six months old, and, if prime, will show a handsome return for the really small amount of time and trouble necessary to rear them."

SHEEP AS AN ASSET ON THE FARM.—In order to improve in a concrete manner the value of sheep on the farm, the following paper, setting out his experiences in handling the flock, was read by Mr. W. G. Crawford:—"In September, 1916, we were renting 230 acres of land at 10s. per acre, in addition to our own holding of 350 acres, making an area of 580 acres, and on the above date we purchased 40 ewes and lambs, and I have kept a strict account of income and expenditure up to the time we disposed of the whole flock in June, 1922. In December of 1916 we purchased another 50 Merino ewes, and still later on 45 Merino ewes, making a total of 135 ewes. However, in November, 1918, we disposed of 50 ewes and 22 had died or strayed during the period under review, so that at the end we had only 63 ewes left. In November of the first year we mated the ewes to two Dorset Horn rams, the total cost of the 135 ewes and two rams being £236. Our total expenses for shearing, sheep dip, tailing, labor, woolpacks, etc., was £20 9s. 3d. In 1918 we had to resort to hand feeding for a few months, and we fed to the sheep 4½ tons of chaff at £4 per ton, making a total outlay, including the initial cost of the flock, £284 9s. 3d. During the 5½ years we have received for wool and skins £337 0s. 1d., for ewes sold at different times £120 8s. 9d., and 498 lambs for £491 12s. 1d., an average of 19s. 8d. nett per lamb showing a nett profit of £664 11s. 8d. on the whole transaction for approximately

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5½ years. This is equal to over £120 per year profit on 100 ewes, and there may still be another one or two dividends to come on wool. The only labor not taken into consideration was the shifting of the flock from one paddock to another. The sheep received very little attention either at lambing or any other time, and they were always grazed on fields that were first fed off by cattle and horses."

SALISBURY (Average annual rainfall, 18.57in.).

August 9th.—Present: eight members.

CONSTRUCTION AND MAINTENANCE OF ROADS.—Mr. F. C. Fleet, who read a paper dealing with this subject, said when an earth road was being formed care should be taken to use soil that contained sand for the surface covering. Drains should be provided to carry the water from the centre of the road. The earth should be spread evenly, and then rolled with a heavy road roller. A plough and scowp and a team of horses were the best and most expeditious method of preparing earth roads. To form the foundation for a metal road the soil should be taken from the sides of the road and placed with an even grade towards the centre. If a depth of 10in. of metal was placed on the road it should be able to carry loads up to about 10 tons. A shoulder of a similar depth would also be required to support the metal. If circumstances would not permit of the latter plan being carried out, soil should be applied to prevent the metal from spreading. The foundation should be rolled before the metal was applied. It was sometimes advisable to form the road with earth and allow it to stand for a season before applying the metal. The bottom layer should consist of metal of a coarser grade than that used for the surface. For the bottom he suggested 6in. metal, and for the top 2½in. The centre of the finished road should have a crown of, say, ½in. to the foot, so that a 14ft. road would have a drainage fall of about 5in. on each side of the road. Quarry screenings he considered to be the best material for binding, and the roller should be worked from the outside towards the centre of the road. Where there was excessive gravitation, such as in hilly country, provision should be made to drain the water off the road by making small drains, about 1 chain apart, towards the water table. Where a watercourse crossed the road, the speaker was of the opinion that a culvert would be more serviceable than a spoon drain. After a metal road had been constructed, no great length of time elapsed before it required attention. Small holes soon made an appearance, and in a very short time these increased in size. Where a district council had control of considerable lengths of metal road, Mr. Fleet thought that a considerable sum of money could be saved if a competent man were employed in the constant patrolling of the road, to repair small holes wherever they occurred. To make a thoroughly satisfactory job of repairing a road, the road should be broken to allow the new metal to bind with the older. The metal used for such holes should be of such a grade that it would fit into the worn-out places without causing any unevenness. Maintenance metal should be of a grade no larger than that used for the crown of the road. Road construction and maintenance work should always be carried out when damp weather conditions prevailed. In those parts of the State where the soil was of a very sandy character, it was the usual practice to scoop out the sand until the firmer subsoil was reached, and that usually made a good road. The speaker concluded with the opinion that for the proper maintenance of roads it was essential that a competent supervisor should be employed, and that the Width of Tires Act should be strictly enforced.

TARLEE.

August 14th.—Present: 18 members and eight visitors.

TRACTOR v. HORSES.—Mr. G. M. Cornish read the following paper:—"Very little progress has been made until quite recent years in the use of tractors on the farm, but the tractor has come into such prominence during the last four or five years that farmers are beginning to ask, 'Is the tractor better than horse power?' Under the spell of highly colored tractor reports, with larger acreage and favorable running expenses, the merits of the horse are apt to be forgotten, especially as one thinks of the novelty it would be to have a tractor obediently pulling the machines. Farmers have had enough experience with the horse to know just what can be expected of it, but we have not had the same experience with tractors. To buy a tractor and think to use it without any trouble is to make a mistake. Reports have been received of the successes of tractors in other places, but do not remember that in South Australia we can produce horses and horsefired more

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cheaply than anywhere else in the world, whilst a tractor costs more than anywhere else, and is correspondingly dearer to operate. Comparisons with America give a false impression, for there the machine costs at least 50 per cent. less, with running costs likewise cheaper. There are several advantages, however, irrespective of cost, to which the tractor can lay claim, the foremost being that in a rush period, with everything running well, the tractor works without getting tired. Long and continuous hours may be spent in rushing a job through. There is also an advantage in the tractor being suitable for various kinds of work. It does not need a wide gate to enable it to go from place to place; it can be quickly moved to another paddock without shifting a lot of gear, and can work an implement close to the fence without loss of time. This question can only be answered when local circumstances, and the ability of the purchaser to adopt the best methods in handling the machine, are considered. If a tractor will work where horses will work, then it is so much more to the credit of the tractor. Horses have been very suitable for farm work, and will continue to be so for a very long time. Tractor power cannot be developed in a small, light running machine. It must be one of fair size and weight. Horse power, per unit, can be increased by breeding better farm horses, by weeding out the unsuitable and weak animals, and gradually building up a team that will be better in every way, and a credit to the owner. I do not think the tractor will be a success in the rough, out-back country. Wear and tear would be too big an item. It is an absolute certainty that it is useless to overload a tractor. Though we say a tractor does not get tired, it is nevertheless very sensitive to overwork. Of course, horses take a great deal of attention: feeding, watering, grooming, and harnessing, which all means valuable time, but what tractor can be run without attention? It is essential that much time and care be given to the machine. It will not stand up to continuous work without it is regularly taken to pieces, overhauled, and properly cleaned. Again, one big advantage with horses is that they can be driven from the seat of the implement, and both horses and implement are under control of one man. The tractor requires two men in all cases, except harrowing. Where only one is employed to manage the tractor and other machines, it means that the plough, the cultivator, and the combine are left to take care of themselves. That means slumping the work, and that is no good. The only remedy is to work the implements from the tractor. The next question, 'Will it pay to invest in tractors?' The average farmer is not in a position to pay £500 to see if a tractor will be a success, for the machines have not yet proved themselves to be a success under all conditions. Those who are now using tractors are paving the way to make them a success. Next, 'Is the tractor suitable under local conditions?' This is an essential point for a farmer to consider before going in for a tractor. In some districts it is undoubtedly better suited than others. Take the limestone soils of York Peninsula. There it should do better on the whole than on the very sandy or black, sticky soils of this district. Next, 'Are horses more economical than the tractor?' To ascertain this it is necessary to make a year by year comparison. If the tractor is to take the place of a team of 10 horses, then it must do the whole work of 10 horses, and cover a whole year's operations. Ten horses should work an average of 250 acres each year: 250 acres fallowing, 250 acres harrowing, 250 acres cultivating—then at least one more working before seeding, 250 acres cultivating; 250 acres seeding with the combine, 250 acres harrowing, 250 acres harvesting, and carting 1,500 bags of wheat. Total acreage, 1,750 acres. To cover 1,750 acres means a lot of wear and tear on the tractor, and the fuel consumption would be considerable. Ten horses would eat, say, 50 tons of hay at £3 10s. per ton, and four weeks' grazing at 1s. 6d. per week, equals hay £175, grazing £3, total £178. There would be less wear and tear on the horses and machinery than on the tractor and machinery, and so a greater percentage would have to be written off against the tractor."

TRACTOR v. HORSES.—Mr. W. F. Edgerley then read the following paper:—"The horse is not yet superseded, and undoubtedly the most valuable way to work a tractor is in conjunction with a team of horses. Great strides have been made in the way of equipping tractors successfully to negotiate boggy country, and under all, except the worst, conditions tractors are well able to follow horses, but on a farm there are scores of small jobs which are more suitably done by two or three horses than by a tractor capable of pulling, say, a 15-horse load. If a tractor and horses are used in conjunction, then the tractor can do the work suitable to it, and the horses can do the smaller jobs which are more suitable to

them. The tractor can do its utmost when horses have to be heavily stable-fed, and the horses can give their maximum power output when outside feed is plentiful. The first and most important point in favor of the tractor, is that it constitutes a great reserve of power. When the necessity arrives, it is capable of being worked all day and all night, and this fact alone makes the tractor a paying proposition to a farmer. Given only a week of fine weather, and good going, the present day full-sized tractor can, if worked to its full capacity, put in, in any class of country, 300 acres of fallow, and the value of this need not be emphasised in a season such as has been experienced this year. Fallowing can be done when desired, either early, for the fallow to obtain the advantage of the winter rains, or late, so that as much feed as possible can be utilised. Harrowing and cultivating can be done in a hurry by the tractor after suitable rains, and before the ground becomes too dry and too hard, and the value of this need not be emphasised. In harvest time the tractor can be going every minute of possible reaping time; there need be no break in the middle of the day, and a maximum of speed is maintained at all times. This fact, then, cannot be too strongly emphasised—that the chief value of the tractor lies in its power to do an immense amount of work whenever special effort is desirable. The second point in favor of the tractor is that it constitutes a great labor-saving device. It is true that a tractor needs a good deal of attention if it is to be maintained in perfect order, but it is certainly not necessary to spend more than half as much time on the tractor as it is on a couple of eight-horse teams. The correctness of this can be clearly demonstrated if one considers all the work necessary to working a couple of teams. Feed for the teams has to be grown, necessitating all the labor involved in working the land and harvesting the crop. The hay has to be chaffed, and even when all this is done, to groom and feed and properly care for two eight-horse teams takes one man a considerable time. In the case of a tractor, the only labor involved in its feeding is the fetching of kerosene from the railway, and the time which must be spent every day for the maintenance of the tractor

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in good order is not a very lengthy job for any one man. Further, though in some districts a man may occasionally be seen driving 14 horses, as a general rule 10 are considered sufficient. A man driving a full-sized present day tractor is driving 16 horses, and there is no need for him either to give his machine two or three minutes spells at intervals, to take two hours off from working time in the middle of the day, or to be at the homestead by sundown. The third point is that power derived from a tractor is cheaper than power derived from horses. It is sometimes suggested that there may be, at some time, a shortage of kerosene, which would, of course, make this commodity dearer and be a serious menace to 'power farming.' With the present consumption of petrol throughout the world this is exceedingly unlikely, and we are all exceedingly hopeful of obtaining a local supply of fuel in the not very far distant future. The consumption of kerosene for farming operations depends, of course, upon the nature of the land, but most country can be ploughed at a gallon an acre, and cultivated for just over half a gallon, and with kerosene at its present price of 1s. 6d. a gallon, this is considerably cheaper than is the cost per acre with horses. Moreover, the tractor only consumes fuel whilst it is working. This is a big consideration at all times, but during a period such as the seeding just past, when both horses and tractors have been idle for several weeks, it is an immense saving. The fourth point is that the tractor is in itself a very powerful portable engine, and when this is taken into consideration, the outlay involved is very little greater than that necessitated by the purchase of two teams of horses and a stationary engine. In conclusion, tractors are only now coming into general use, but it is already amply proved that they are to play an important part in the agricultural activities of the State. Although we have just passed through one of the wettest winters on record, still the demand for tractors is greater than at any previous period. It is noticeable that in a great many cases, when a tractor is purchased, its owner, having been used to horses all his life, fails to get on with the tractor quite as well as he did with the horses, but when he has become acquainted with his machine, becomes enthusiastic as regards its abilities, and, therefore, obtains the maximum benefit from his possession."

OWEN, August 31st.—Mr. F. W. Jones, who had just returned from a trip to England, read an interesting and descriptive paper dealing with agricultural practices in England.

TWO WELLS, August 27th.—The meeting took the form of a social evening. Mr. F. C. Richards, of the Department of Agriculture, was present and delivered an address, "The Work of the Agricultural Bureau," to a gathering of 12 members and 30 visitors. Mr. Pike, Chairman of the Mallala Branch, was also present, and gave a short address. Vocal items were contributed by several of the members and visitors, after which supper was supplied by the ladies.

WATERVALE, August 20th.—An interesting discussion took place on the subject, "Fruit and Vegetable Growing." Several other topics of local interest were also brought before the meeting.

WILLIAMSTOWN, August 24th.—To a gathering of 23 members and two visitors the Superintendent of Experimental Work (Mr. W. J. Spafford) delivered an address, "Fertilisers."

YORKE PENINSULA DISTRICT.

(TO BUTE.)

KILKERRAN.

August 21st.—Present: six members and two visitors.

QUESTION BOX.—The meeting took the form of a "question box." The first question brought before the meeting was as follows:—"Is an eight-horse team, whose working order is two, three, and two, stronger than a six-horse team, yoked in a four and a two?" Members agreed that everything depended on the weight of the horses. If both teams were equal, then it was thought that there was no difference in the pulling power of each horse, because the distance from the implement did not have very much effect with such a small team. "Which is the better method of driving a 10 or 12 horse team, abreast or tandem?" It

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was agreed that the tandem was to be preferred, because unless the large abroad team worked evenly, the implements did not follow a true course, and secondly the tandem team dispensed with the heavy and cumbersome swings. "Which is the best fodder to sow for paddock feed for horses and cattle?" Mr. Dutschke favored Cape barley. Mr. R. Wakefield said lucerne could not be surpassed for dairy cattle. Mr. B. Koch expressed a preference for Algerian oats. "At what age should a young horse be put to work?" The majority of members thought 2½ years about the right age to place the colt in work. Mr. Wakefield thought the youngster could be broken in at 1½ years of age, but it should only be worked lightly and it should be given plenty of good feed. Mr. B. Koch considered that horses should not be used for heavy carting work until they were at least 7 years old.

WEAVERS.

July 23rd.—Present: 17 members and visitors.

FALLOWING.—"I consider early fallowing is necessary for the production of profitable crops of wheat," said Mr. H. Bishop, in the course of a short paper dealing with the above subject. The land should be worked to a depth of from 2in. to 2½in. and harrowed at the first favorable opportunity. The farmer should not attempt to deal with more fallow than he could harrow and cultivate at least once before hay making. For working back the fallow he thought the cultivator did a better job than the skim plough. A flock of sheep running on the fallow assisted in killing the weeds, and the land should not be worked whilst in a dry condition, unless "dog weed" was making a strong growth. In the discussion Mr. F. Anderson considered that the working of the soil was almost solely dependent on the climatic conditions that were experienced during the year. Messrs. A. and J. Sherriff were of the opinion that new land should not be harrowed, but left in a rough condition so that the action of the sun during the summer would have a sweetening effect on the soil. Mr. J. Nation said in places where deep ploughing was essential, it would be necessary subsequently to use a spiked roller to consolidate the soil.

WEAVERS.

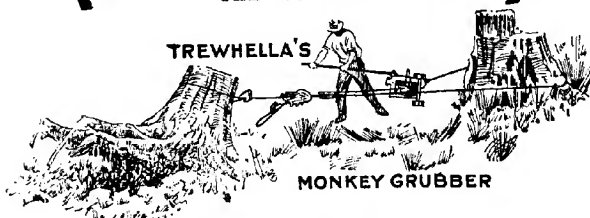
August 20th.—Present: 16 members and five visitors.

SHEEP.—In the course of a paper under the title "Advantages to be Gained by Keeping a Better Class of Sheep," Mr. J. Bishop said there were numerous graziers who owned small flocks of sheep, and it was deplorable to see the types of ewes and rams that were used for breeding. Again, it was noticed that a farmer secured a really first class ram, but mated it with unclassed ewes. One frequently heard the remark, "Any ram will do so long as it gets the ewes in lamb." Sight was lost of the fact that judicious classing and mating would increase the quality and quantity of the clip, whereas the indiscriminate mating meant no progress and every possibility of the clip being reduced each year. By careful selection, Mr. Bishop stated, he had raised his clip from an average of 9½lbs. of wool per sheep in 1917 to 16½lbs. from ewes which had been bred from the original flock. From one flock of 30 ewes he had obtained an average return of £1 5s. 8d. per fleece. The speaker was convinced that any success that he might have gained was due to one good ram that had been mated with carefully selected ewes. No money was so advantageously expended and so quickly repaid as that used in the purchase of a high class ram. One frequent mistake on the part of small breeders was that of purchasing rams from different breeders. Uniformity of type was one of the most important essentials in a flock of sheep. Sheep with the following characteristics should be secured:—Large-bodied animals, broad on the back, wide between the legs, square, with plenty of depth, clean faces, and standing square on their legs. If the flock were kept for breeding young ewes, from which it was intended to breed again, the man who used a mongrel ram would have been able to purchase a good ram with the money that would be lost in the decreased production of the young ewe. The discussion turned to the subject whether the flock should be kept for wool or fat lamb raising. Most members were not in favor of keeping the flock for the purpose of sending lambs to market. Mr. F. A. Anderson referred to the advantages of sowing green feed for the flock and mentioned the superiority

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of Cape barley over Malting barley for green feed. Messrs. A. Cornish and J. Honner referred to the menace of the blow fly pest, and gave methods of combating the flies with the use of sheep dip and jetting.

PASKEVILLE, August 21st.—Fifteen members and one visitor were present at the August meeting of the Branch, when a paper dealing with the subject, "Dipping Sheep," was read by Mr. R. C. Cowan. An interesting discussion followed.

WESTERN DISTRICT.

ELBOW HILL (Average annual rainfall, 11in. to 12in.).

August 21st.—Present: eight members.

AFFORESTATION.—Mr. H. W. Wheeler contributed the following paper on this subject.—"In dealing with this subject, the first thing necessary is to point out some reasons why busy farmers in a comparatively dry district should devote a certain amount of their valuable time to tree planting. First of all, it was only a matter of a few years ago that any timber at all that a farmer required for building purposes, that is, either for wooden sheds, or timber for iron buildings, or iron roofs could be found in almost unlimited quantities amongst the pine patches that grew on most of the farms in this district, whereas at the present time it would be a hard matter to buy enough pine posts to make a fowl house. The timber has been removed to bring the land under cultivation, and in many instances in my own experience I have seen hundreds of beautiful pine posts and rails burnt to get them out of the way, and naturally in those early days of settlement when the timber was the biggest difficulty the settlers had to remove no thought was given to the planting of fresh trees in convenient places as a standby in future times, either for windbreaks, shelter for stock, or for the timber as a commercial proposition. Some experts tell us that where the rainfall average is inclined to be light, by removing the natural timber growth, it becomes lighter and more irregular. This seems to my mind quite a feasible argument, because moisture attracts moisture, and there is certainly more likelihood of green timber having a beneficial influence on the rainfall, than would be the case where the country has been reduced to a state of bare plains. Then again there is the appearance of the home surroundings. To my mind nothing looks better nor stands as a better monument of taste and forethought on the part of the original owner of a farm than a patch or belt of the original timber that has been preserved and cared for to provide shelter from the weather, and with the idea in view of perpetuating a sample of the natural scenery in its virgin state. Where this has been done in the older districts of our State, and even in the older parts of this district, we find that the mallee we so much despise, or the natural gum, pine, or even sandalwood trees that grew where nature planted them and where the owners of the land have gone to a little trouble to protect them, will always hold their own for appearance with the best ornamental trees we can plant. However, the trouble in that instance with most of us is that we are not original selectors of our land, and we have had no choice as to what part of the farm shall be left as a timber reserve. The land has been cleared by those who went before us, the hardy pioneers, and I guess many of us are thankful for that fact. But, all the same, I believe that if we are to make the country and country life more pleasant and attractive, one of the most important matters we must get busy about is re-afforestation. It is pleasing indeed to notice the splendid lead the Department of Agriculture is giving us in this respect—I mean the thoroughly practical way they are testing various kinds of both commercial and ornamental trees on the experimental farms in various parts of the State. After visiting our own local Government Experimental Farm at Minnipa, I strongly advise every practical farmer in this and any other district of Eyre Peninsula to go at first opportunity and see for himself the splendid results that are being achieved from the efforts of our departmental officers, particularly in respect to tree planting. The oak trees that form a windbreak to the orchard are an eye-opener, and also the olive plantations, to say nothing of the different fruits that are doing splendidly. It we are going to take this matter to heart, and set about some system of planting that is going to reward us with

any degree of success, then it is no use selecting the best of trees irrespective of whether they are suitable to our class of country, and planting them in a haphazard fashion, that is merely wasting time and expense. To my mind, the planting of ornamental trees is more than a mere hobby, it is a necessity. Our natural timber, as I have already pointed out, is fast disappearing and we must plant something in its place. I do not consider it a wise plan for a farmer to spend too much energy trying to grow fruit. A few trees around the house are quite all right, but for anything like an extensive system of planting, the first point to consider is the laying out of a scheme that can be commenced in a small way, and added to each year, with each kind of tree in its own allotted place, so that when the trees have got a few years growth on, the whole scheme or surroundings will present a neat and well-laid-out appearance. Secondly, what kind of tree to plant. The trees that seem to show up best in this district are the sugar gum and the South Australian blue gum. I commenced a small scheme of planting last year, but unfortunately it was such a severe drought that out of about 30 trees only four survived. Only one tree survived the whole year without being watered; that was a blue gum. Two white flowering she-oaks received water occasionally and did well. This year I have planted several kinds of trees, including sugar gum, blue gum, Aleppo pine, New South Wales swamp oak, and fig trees. Most of them are doing well, but the sparrows are playing havoc with the young oaks, of which I planted two rows for a wind-break on one side of the house. My reason for setting down the different kinds of trees I am experimenting with is that I hope at some future date to report to this Branch as to how each kind of tree is progressing, and I also sincerely hope that the other members will follow on a similar line. I am a novice at botany, and practically only a beginner on my present holding, but I have thought for years that something should be done by our public bodies to beautify in some measure the empty spaces on our reserves, and in many places there is ample space on our 3-chain roads for small plantations which could be so planted and fenced off that no obstruction need be caused to the traffic, and a little effort in this direction expended from time to time would be time well spent. Our public schools are doing a splendid work in this direction, and I am sorry I have not time at present to offer more suggestions for educating our rising generation in this important matter." During the discussion which followed, Mr. J. A. Williams thought it was a difficult matter to determine the best kind of tree to plant. He thought it would be a good plan to plant trees as a breakwind. Mr. M. A. Wildman advised members to plant olive trees. Mr. W. T. Cooper said a plantation of trees would help to beautify the homestead; he thought planting olives was a good suggestion. He would also devote a small plantation to various trees for the benefit of future generations. Mr. T. Wildman agreed with the views of the writer and said that trees acted as a good breakwind; they would also assist in preventing drift.

GREEN PATCH (Average annual rainfall, 26.56in.).

August 20th.—Present: eight members.

SUITABLE WHEATS FOR THE DISTRICT.—The meeting was held at Mr. R. L. C. Sinclair's homestead, when an interesting discussion took place on this subject, in the course of which it was thought Queen Pan was a suitable wheat for the rich soils of the district. Mr. C. Dorward considered Federation to be the best wheat for the poorer types of soil. Mr. F. Parker considered Late Ghyas to be the best wheat for the wet portions of the district. Mr. C. Whillas thought the district too wet for the successful growing of wheat. He advised members to top dress grass lands with about 1cwt. of super to increase the stock carrying capacity of the land. The Hon. Secretary (Mr. R. Sinclair) reported that he had applied super to some of his pasture lands and that he was very pleased with the results.

O'LOUGHLIN.

August 22nd.—Present: six members.

MIXED FARMING.—A short paper dealing with this subject was read by Mr. E. A. Hastings, in the course of which it was stated that mixed farming was an aspect of agriculture that had been neglected in that district. When the district was first

thrown open for settlement, there was no incentive for the farmer to carry such profitable side lines as pigs, poultry, and cows, but now that the locality was served by a regular steamer service, with a deep sea port at Cape Thérvenard, a railway running through the district, and a good number of men employed in the vicinity, many of the side lines raised on the farm could be consumed in the district. Sheep were, without a doubt, the most profitable side lines on the farm, providing the farmer had sufficient land cleared to enable him to crop and fallow, and still have a fair area available for grazing. An interesting discussion followed, in which the majority of members thought pigs would prove the best side line for that district, because most of the settlers were not in a position to erect sheep-proof fences.

LAKE WANGARY.

August 25th.—Present: seven members.

CARE OF THE RAM.—Mr. P. Houston, who read a paper dealing with this subject, said farmers and graziers often paid good prices for rams bred by reputable breeders with the object of improving the wool production of their flocks. The rams were usually brought into their new district "in the wool," and when shorn gave a satisfactory cut of wool. At the following shearing the opinion of the farmer regarding his purchase might have considerably altered, and the ram might possibly not yield such a good fleece. The owner would then perhaps feel that rams from such a breeder were not suitable, and he would then procure his next draft of rams from another stud master, and so that practice might continue for a number of years. The usual practice of the farmer after he had taken delivery of the rams was to shear them, with the result that with from 13 to 14 months' growth of wool they cut a fleece weighing 20lbs. and over. The rams were then turned out on good spring feed, and appeared to do very well until required for the ewes. About December or January, they were mated with the ewes and kept with the flock for about eight weeks. At the end of that term, owing to the great demand that had been placed on their system, they were naturally in a very low condition. In such a state, they were then turned into a bare paddock. Hardly a thought was given to them until the next shearing season arrived, and the farmer was disappointed that the cut from the rams did not equal last year's return. It was quite probable that one of the rams of the draft would give a better fleece than another, and the farmer would immediately think that it was the better ram, but the fact that such a ram had probably been the poorest sire of the flock was overlooked. When the rams were separated from the ewes they should be placed in a small paddock that had previously been sown with some fodder such as kale, lucerne, or rape, and that, with access to a good salt lick and a supplementary ration of 1½lbs. of oats per day, would assist the rams in building up their original bloom. The extra wool that would be obtained was well worth the trouble of special care and attention, to say nothing of the vitality that would have been added to the rams for the next season.

RABBIT DESTRUCTION.—Mr. J. A. Shepperd, who contributed a paper dealing with this subject, said whilst the rabbit was perhaps one of the greatest pests against which the farmer had to contend, there were many ways of keeping it under control. It was to be regretted that some landholders made no efforts to keep the rabbits under control, but allowed their farms to resemble a breeding ground for vermin. In places where it was possible, the burrows should be dug out, but in stony places, where that plan could not be adopted, traps could be used. A couple of good running dogs, and one to hunt the rabbits from their hiding places would also account for a large number of rabbits. A good price could be obtained for the skins if they were properly pegged out. When the skin had been removed from the rabbit it should be placed on a bow made from a coarse piece of wire about 3ft. in length. Both ends of the bow should be made as square as possible. The skins should be hung up in the shade to dry, and painted with sheep dip or a prepared skin preserving compound. When removed from the bows, the skins should be placed between two pieces of deal and bound tightly together, so that they would be kept in shape and not lose weight.

ROBERTS AND VERRAN.

August 21st.—Present: nine members.

FARMING MALLEE LAND.—The following paper was read by the Hon. Secretary Mr. B. Evans):—"To secure the best returns from mallee land, it is necessary to clear the land of shoots and stumps as soon as possible. For this reason every effort should be made to have a succession of stubble fires over the land, because burning is undoubtedly the quickest method of killing shoots. Scrub should be rolled early, and be ready to burn on the first good day in February. I have found that if the scrub is rolled about 18 months before it is burnt a greater number of stumps are killed, but when this method is adopted the scrub does not burn up so cleanly. For working new land, I prefer a medium weight share plough, but if there is a large area to put in, a cultivator could be used. About 2 1/2 in. is sufficient depth to plough the first year. About the end of April or early in May is the best time to drill wheat on virgin land, because the earlier it is put in the better, and as there are no weeds to trouble the first crop, it can be put in dry if necessary. The second crop can also be wheat. The stubble land should be ploughed as soon as possible after the stubble is burnt, and cultivated ahead of the drill, if possible after a rain. The third crop should be oats, an early maturing variety for preference being sown. By this time the shoots should be fairly well under control, and the land could be left out a year for grazing, and then fallowed. If the shoots are to be thick, they should be cut and burnt during the summer prior to fallowing, because a good seedbed cannot be prepared in very bushy land. For fallowing I prefer a fairly heavy plough with a strong team, so as to pull out as many stumps as possible. This work should be commenced in July, and if possible the stumps should be picked up in time to work the fallow with the cultivator and harrows in the spring. Two inches is sufficient depth for the first fallowing, but as the land is cleared of stumps this could be increased to 3 in. In working the fallow, care should be taken not to work the cultivator in too deeply, because the aim should be to pack the lower layers of soil, leaving the immediate surface in a loose condition. By this time it should be possible to work the land on the four-course rotation, fallow, wheat, oats, and grazing. If this system of cropping is carried out, there should be little fear of take-all, which takes a heavy toll of wheat crops in the mallee country every year. Late varieties of wheat are not suitable for this district, the best returns usually being secured from early varieties, but mid-season wheats could be used for early sowing. For new land, I think, 45 lbs. of seed is sufficient, but on land that has been under cultivation better returns would be gained by sowing about a bushel per acre, with 1 cwt. of super. When growing oats for grain 1 bush. of seed per acre would probably give a maximum yield, but for hay crops, the seed should be increased to 60 lbs. This would not only increase the yield, but would result in a finer straw. As soon as there are sufficient paddocks available, the holding should be stocked with sheep, which are not only a valuable source of income, but do a great amount of good in checking the growth of weeds and bushes, as well as improving the fertility of the soil. I prefer Merinos for this district, but with a market for fat lambs, a quicker maturing and larger framed sheep could be bred from Merino ewes by a Dorset-Horn ram. Ample provision should be made for conserving water, and a good supply of fodder should be kept on hand." In the discussion which followed, Mr. G. Smith said he did not favor deep ploughing, because the land did not "pack" properly to make a good seedbed, and very often caused take-all to appear in the crop. Mr. H. Simmons favored light ploughings for the first two years, but preferred ploughing about 3 in. when fallowing, so as to pull the stumps out as soon as possible. Mr. F. Masters wished to know of a good early variety of oats. Deep ploughing was not a payable proposition in mallee country. He thought the land could be worked more often to advantage. Mr. M. Masters agreed that the sooner the rotation system was introduced the better. He thought 3 in. was sufficiently deep to plough until the land was well cleared and set down, but he thought it could then be gradually worked to a greater depth. The land should be heavily dressed with super, the heavier the better. In reply to Mr. F. Masters, the writer mentioned "Ruakura" as a quick-growing variety of oats. He did not favor deep ploughing in bushy land.

SMOKY BAY (Average annual rainfall, 13.06in.).

June 23rd.—Present: 10 members.

FALLOWING.—Mr. E. D. Lovelock, who read a paper dealing with this subject, said one of the first points that required attention before fallowing commenced was to see that all stumps projecting above the surface of the ground were levelled off, because it was possible for a small stump that was not level with the ground to lift the plough out of the land. After seeding was completed, a narrow strip of oats should be sown, just outside the fence, to assist in preventing the sand from drifting on to the fence. Prior to the commencement of fallowing, the plough should be overhauled and the shares sharpened. If sheep were kept on the holding—and the speaker considered them a most necessary factor in the successful working of the land—they should be grazed on the land some little time before the plough was brought into use. If possible, fallowing should be commenced during the latter part of June or early in July, because early fallow had a tendency to prevent the development of the take-all fungus. For that district he thought that the land should not be worked at a greater depth than from 2in. to 2½in. A few weeks after the fallowing had been finished the land should be worked with a light scarifier to leave the land in a rough condition, and so minimise the danger of drift. Should weeds make their appearance on the fallow, the sheep could be relied upon to keep them in check. Any hollow patches of land that were especially subject to drift should be covered with stable manure and straw, which would assist in retaining the soil when it was blown over the holes.

YALLUNDA FLAT (Average annual rainfall, 18in. to 19in.).

August 18th.—Present: 10 members.

FODDER CROPS.—The following paper was read by Mr. W. R. Richardson:—In writing on this subject it is not only the object of providing feed for our stock that I have in view, but also the general improvement of the land. For a number of years I have been of the opinion that to get the most payable returns from the farms in this district, we must go in for mixed farming and increase the stock-carrying capacity of the land to the maximum instead of simply depending on cereal crops. In most cases the soils are light and deficient in humus, and continual cropping with cereals tends to exhaust the humus, and naturally the crops suffer. One way of returning humus to the soil is by crowding stock on small areas, and to do this we must grow fodder crops, which can be grazed by the stock. The main object of growing fodders, however, is to provide feed for the stock when the natural herbage is poor or through the summer months, when there is a scarcity of feed. As a general rule, we have a long, wet winter, and too frequently one sees unthrifty and poor, undersized weaners trying to eke out a living when the feed is short and making no growth. One also notices miserable lambs with their mothers in such poor condition that they are unable to give them proper sustenance. This could be avoided by putting in a week's work at the end of March with the drill and cultivator, to provide sufficient feed to enable the ewes to rear a good, lusty lamb. We must remember that fodder crops, or catch crops as they are sometimes called, are more or less a gamble, and if we fail one year there is no need to be discouraged. For instance, rape may be sown early in the autumn in anticipation of the season breaking early, but the rain holds off until late and the weather sets in cold and the rape makes poor growth. Or we may sow a crop for summer fodder and get an exceptionally dry summer, and a failure of the crops. But it must be remembered that these are exceptional years, and not the general rule. To provide feed for winter, I recommend sowing a mixture of rape, oats, and white mustard. The latter is a very quick grower. If you have a small paddock, fallow it and work it down well in the spring, and then drill it towards the end of March or early April. Rape is best sown when the ground is moist enough to start germination, but if it does not lie too long, germination will not suffer. Sow about 1½bush. of oats, 3lbs. of rape, and 1lb. of mustard per acre with about ½cwt. of super. If this crop makes an early start, it will insure an abundance of good feed early in the winter. Another good method of providing winter feed is to burn off a stubble paddock in March, and immediately run the cultivator over it, and drill in oats or barley. We had a very good growth this year on about 70 acres of stubble, and it was a very

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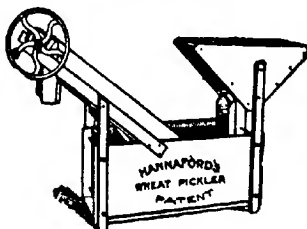
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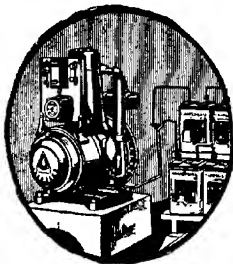
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interesting experiment. On different parts of the paddock we put Scotch Grey oats, Cape oats and barley mixed with rape, a little Subterranean clover and Wimmera rye grass. It was too late for the rape, which, however, did well in patches. The grasses, of course, were for future pasture. The Scotch Grey oats yielded the best early feed, and when we put the sheep on the paddock towards the middle of July, the crop in places was a foot high. If oats are sown on the stubble without rape they can be fed down until reaping, and often yield a fair crop. Rape is a wonderful fattening fodder, and provides a great bulk of feed. It has a large tap root, which goes straight down and opens up the lower layers of soil. Care must be taken to accustom the stock gradually to rape, because it will cause them to blow if they are given too much at the first feed. For this crop the ground should be worked to a fine tilth and the seed sown to a very shallow depth. These are the winter fodders which we have proved to be the most successful, and even a small area will often save a lot of worry in the winter when feed is scarce. Peas, although sown in May or June, are not fed until spring or summer, and our experience has been that they are the most valuable crop for providing summer feed, because there is not so much risk of failure as a spring sown crop. For some years we tried peas as a fallow crop, but without very much success. For one thing, it is generally too late before they are sown, and secondly, one is not able to work the fallow. A better practice is to fallow after peas. To obtain the best results peas should be sown on fallow, during May, with 80lbs. to 100lbs. of super, and 1½ bush. to 2 bush. of seed per acre. It has been recommended to sow 1 bush. of oats and 1 bush. of peas. This mixture having the reputation of being an excellent crop for fattening stock. Peas can be fed any time from November until April. They do not seem to deteriorate through being allowed to lie on the ground, and we have left them until April and put the ewes to lamb in the paddock. On a small paddock of 10 acres of peas we kept 180 weaners for six weeks. Peas is a costly crop to put in, because the seed usually costs from 8s. to 10s. per bushel, but when the results are considered, it is cheap at the price. Up to 15 sheep per acre can be fattened on a good crop of peas. Of the spring sown crops, the only ones we have grown successfully are sorghum and Sudan grass. A review of the rainfall records for the last few years will be interesting to see what summer rain falls, because it is on these that the success of the crop depends. The rainfall from October to March since 1911 is as follows:—

	1914-15.	15-16.	16-17.	17-18.	18-19.	19-20.	20-21.	21-22.	22-23.
Oct.	63	74	178	238	235	132	185	116	—
Nov.	139	22	216	94	7	12	183	253	—
Dec.	145	—	33	79	133	57	89	63	50
Jan.	37	13	83	28	70	10	120	139	15
Feb.	12	—	165	6	139	—	33	11	—
March	31	35	143	25	5	35	83	20	—


Of these nine years, 1915-16, 1919, and 1922 are the only years when conditions were so dry as to make summer crops likely to fail. In the other six years there were good rains at intervals throughout the summer. I consider we can, with advantage, make use of the fallow for sowing sorghum or Sudan grass. The crops are not sown until the end of September or early in October, which gives the chance of thoroughly working the land and killing all rubbish. Sorghum makes an excellent fodder and grows a large quantity of feed. It also grows rapidly after being fed down. In 1920 we sowed a paddock with 10 acres of sorghum, two of maize, and one of turnips. The last named were a failure, and germinated very badly. Plants which did come up were taken by the grubs. The maize did well, until the hot winds started, and grew to 18in. or 2ft. high and then stopped. The sorghum did remarkably well and grew to 5ft. and 6ft. high in places. After feeding off grew again rapidly. The following are the particulars of treatment:—The land was ploughed at the end of August, worked up with a spring tyne cultivator, and drilled on September 21st with 8lbs. of sorghum and 80lbs. of super. per acre. The rainfall was not particularly good that year, which goes to show that good results can be obtained on moderate rainfall. On December 28th we put 290 sheep in this paddock of 14 acres in all, and removed them on January 13th—17 days' grazing. On March 1st 250 sheep were grazed in the paddock, and on March 15th they were taken out—14 days' grazing. On

May 4th we put in 80 ewes and lambs—nine days' grazing. On May 5th we put in 78 ewes and lambs after eight days' grazing. On May 13th 158 were removed, and on May 16th the same number were put back in the paddock. They also had the run of another small paddock of about 30 acres. The sheep were finally moved on May 26th. The grazing of this paddock works out at approximately 11,054 sheep for one day on the 10 acres or sorghum, or an average of three sheep per acre for the year, and when we consider that the whole cost of putting in the crop works out at about 21s. per acre, it was a very profitable crop. The following year we sowed about 20 acres, but germination was very poor. We have only grown Sudan grass once, and that was last summer. It was not put in well, but the results convinced us that it is a most hardy and valuable fodder, and would, under favorable conditions, do well here. This crop was put in in the same paddock as the sorghum just mentioned. It was ploughed on September 28th and 29th, after 60 points of yain, and as the ground was hard it was not a good job. It was harrowed and drilled on October 3rd, and then harrowed. There was practically no germination until after the rains in December, and then it came up thinly. In spite of the very dry summer we were able to keep four or five cows on it for three months, besides feeding it down a couple of times with sheep, and it kept growing all the while. In concluding, gentlemen, I would remind you that it is important to have the ground thoroughly worked to a good tilth for spring sown crops, and to plough the ground intended for sowing as early as possible after seeding is finished. I would urge all to go in more for growing fodders and finding out the most suitable, because I am sure you will find the benefit of them, both in improving the land and stock, and you will also be prepared when the freezing works start, and will be able to be of great assistance in making them a success."

BIG SWAMP, August 23rd.—The Hon. Secretary (Mr. J. W. Winch) read extracts from the *Departmental Bulletin* "Feeding Tests with Pigs," and an interesting discussion followed. For bacon for home use, Mr. Simes favored an animal weighing about 160lbs., but for curers and marketing purposes the majority of members favored a much lighter animal.

COLLIE, August 25th.—An address, "Past Experiences in Farming," was delivered by Mr. J. W. Lynch to a gathering of 14 members and five visitors. An excellent exhibit of turnips was tabled by Mr. J. Dolphin.

YADNARIE, August 21st.—Mr. O. Forbes read an article from the *Journal of Agriculture*, "Stimulating Interest in the Work of the Agricultural Bureau," and a keen discussion followed. The Hon. Secretary (Mr. A. Jericho) referred to the very good results that had followed the introduction of experimental plots con-

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ducted under the auspices of the Butler Branch of the Agricultural Bureau. Mr. J. J. Deer said if the Bureau was discontinued farmers would perhaps realize more fully the benefits that they had received from the organisation in the past. Several other members spoke, and all urged members to maintain a live interest in the work of the Branch.

YEELANNA, August 18th.—Mr. F. Proctor read a paper, "Agricultural Education on Eyre Peninsula," in the course of which he eulogised the work that was being done by the Agricultural Bureau. He also expressed the opinion that each Branch on the Peninsula should receive more visits from the departmental experts, and thought that a school for farmers held at the Minnipa Experimental Farm, and conducted on the same lines as the Winter School for Farmers at Roseworthy Agricultural College, would be well patronised by members of the Bureau on Eyre Peninsula.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

CLAYPAN BORE (Average annual rainfall, 16in. to 17in.).

August 27th.—Present: eight members.

FARM BUILDINGS.—In the course of a paper dealing with this subject, Mr. W. B. Andrews believed it was a better plan to erect a large shed and divide it into small partitions rather than to have a number of separate small sheds placed in different parts of the homestead block. The partitions could be made with rails, whilst the outsides could be formed with wire and broom bush. With a gable roof on the large shed, the amount of timber and iron required would be reduced to a minimum. The post for the stables should be 4in. x 4in., but the remainder of the timber could be 3in. x 2in. jarrah, with 4in. x 1½in. rafters bolted to the tops of the posts, with 3in. x 2in. purlins to carry the iron. Screw-pointed nails should not be used for the iron, because they made a dent in the material before they went through the iron. The farmer who was not an experienced builder should first erect one side of the gable, and the other could then be added. A pitch of 2in. to the foot should be made on the roof, and then finished with a 10in. ridge capping. If gutters were to be used they should be placed in position before the other work was taken in hand. The holes should be bored in the tops of the posts before the latter were placed in position. When the posts were fixed, one nail should be placed in the rafter against the hole in the top of the post, and a hole bored through the rafter. When commencing to build, a start should always be made from the top of the post. If the shed wall was 8ft. from the ground level, all the posts should be marked 6ft. from the top. Next, two posts should be placed in position and levelled to about 8ft. apart, and if a piece of board was nailed on to the 6ft. mark on the posts, then the tops of the two posts should be level. Next, a piece of board should be fastened to the 6ft. mark on the posts at the other end of the shed, and by sighting over the three pieces of board the shed should be level from end to end. The same plan could be carried out with all the other posts. For the horse yard he favored a post and rail structure. The large shed should be situated south-east or north-east from the dwelling-house, because the wind did not blow for any length of time from those directions.

MARAMA.

August 27th.—Present: 14 members.

FALLOWING.—The following paper was contributed by Mr. E. C. Tilley:—"I consider a farmer, either on plain land or in the mallee areas, should take the first step towards fallowing during the summer months, by seeing that a good burn is obtained on the land he intends to fallow. Fire is very essential to the land, and especially in the mallee areas, it improves the wheat-growing qualities of the land, checks the growth of mallee shoots, and clears all rubbish off the land, thereby enabling the plough to make a better job of the fallowing. To obtain the best results, the land should be fallowed as early as possible after

seeding, thus enabling the soil to absorb all the available moisture during the spring and summer months. I think a farmer could afford to give his team a short spell after the seeding is finished, it will freshen them up, and give them a better heart to go on with the work of fallowing. While the team is enjoying a rest, they should be stabled and well fed and not turned out, as is too often the case. The farmer should thoroughly overhaul the plough, and see that it is in good order. See that each body of the plough is straight and well set, put in new bolts where they are required, and pay special attention to the shares. I favor the share plough for fallowing. The disc has a tendency to run over the roots, but the share breaks a good percentage, and where the mallee is growing this in itself is a big consideration towards terminating the life of the mallee, and also retaining the moisture in the land. The swings and chains also require attention, for by giving this one may avoid breakages and loss of time during fallowing. Under local conditions, I think a team of eight horses on a six-furrow fallowing plough is about the required thing, because they will work it comfortably and at a fair depth. The depth, of course, depends on the class of land fallowed. In this district, where clay is close to the surface, as is the case in some of the flats, it is a mistake to fallow deeply—a depth of 2in. is sufficient, but on the sandy soils about 3in. is required. Where we have undulating country to work, it is a good plan to mark the work out in lands according to the sandridges, and always throw the furrow downhill and finish the lands as near the crown of the ridge as possible, and at the completion plough the corners out. Now, when the first stage of fallowing is completed, the harrows should then come into operation. Work a good set of six-leaf heavy harrows and put eight horses on them, and cross harrow the ploughing. In mallee land, where stumps plough out freely, the harrows will bring roots to the surface, making it easier to handle them. After the harrowing is finished the stumps should be removed before any further working of the land, and where a farmer is within carting distance of a railway siding the stumps are well worth stacking room on the land, and have been the means of a living for many a mallee settler. With the stumps cleared, the cultivator or skim plough can be brought into action. I find from experience that a spring draught cultivating plough is a very good implement for working back the land. In a new district, where farmers are not sufficiently advanced to have sheep to keep the fallow clean, more labor is required to work the land. In working the fallow back, advantage can often be taken of suitable weather for killing the rubbish. After the ploughing back, and another good cross harrowing, the fallow should nearly be ready and not require much working at next seeding time. By fallowing one can use larger implements at seed time, and a greater area can be put under crop. Under local conditions, where sandy soils are liable to drift during the summer months, it is a mistake to fallow close to fences, because often a line of fence becomes partly submerged with drift. This can be avoided by leaving a strip not fallowed, say one chain in width, from the fence. This will be a great help towards keeping the fence free from drift, and at next ploughing season these strips can be broken up and worked in with the fallow when seeding. It should be every farmers' ambition to fallow as much as possible, especially in the new mallee districts, because during lean seasons it accounts for the difference between "crop failures" and "profitable returns." In conclusion, keep in mind the following points:—Feed the team well, and fallow as early as possible, keep the implements in good order, and work according to the weather and the weeds. Good fallow is the secret of success."

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

August 26th.—Present: 18 members and two visitors.

WHEAT CULTURE.—A short paper dealing with this subject was read by Mr. G. Katchek, in the course of which it was stated that the first essential for the production of good crops of wheat was the preparation of early fallow. For that district he thought that land should be worked to a depth of about 3½in. to 4in. The fallow should be brought to a good compact seedbed with the aid of the harrows, and then worked with the spring-toothed cultivator. He did not think it advisable to start seeding immediately after rain had fallen; it was better to allow at least 10 days to elapse, so that the weeds would have had a chance to

germinate. The farmer should endeavor to procure good, clean seed, and to reduce the risk of smut to a minimum all seed should be pickled. He thought that the best method of pickling was that of turning the grain backwards and forwards on the ground with a shovel. It was a good plan to pickle the seed some little time ahead of sowing, so that the seed would be dry before it was placed in the drill. The farmer should realise that as a general principle a small area of well-worked land would give better returns than a large tract of land put in carelessly. An interesting discussion followed, in which members expressed themselves in favor of various methods of pickling seed prior to seeding.

BERRI, August 20th.—Mr. F. Murray Jones, B.V.Sc., M.R.C.V.S. (Deputy Government Veterinary Surgeon) attended the meeting and delivered an address.

BLOCK E, August 21st.—Mr. W. E. Muspratt (Irrigation Instructor and Inspector) attended the meeting, and delivered an address, "Planting the Block, with Special Reference to the Conditions under which Settlers in the Chaffer Area will be Working." Mr. G. Kubank reported the following results of the Annual Ploughing Match held on August 17th:—Mr. W. B. Carr 1st, 19 points; Messrs. Kubank and Pethick equal for second place, with 17 points each; and Mr. E. W. Williams 3rd, with 15 points. The work was judged by Messrs. L. Pitt and A. Flaherty, who congratulated the competitors on the fine work that had been accomplished.

COOMANDOOK, July 25th.—Mr. E. Leishmann (Orchard Instructor and Inspector) attended the annual meeting of the Branch and delivered an address, "The Principles of Pruning." On the following day Mr. Leishmann gave a pruning demonstration in Mr. Chapman's orchard.

HALIDON, June 27th.—An interesting and instructive paper, "Soils," was contributed by Mr. F. Gascoigne, and a keen discussion followed. A further meeting of the Branch was held on July 25th, when Captain S. A. White, C.M.B.O.U. (Vice-Chairman of the Advisory Board of Agriculture), attended the meeting and delivered an address, illustrated with lantern views, "The Economic Importance of Bird Life," to a gathering of 100 people.

MOOROOK, August 24th.—Mr. A. G. Carne read an instructive paper, "The Soil," from notes that had been prepared from lectures given at the Roseworthy Agricultural College Winter School for Farmers. An excellent discussion followed the reading of the paper.

MURRAY BRIDGE, August 14th.—The meeting took the form of a "Question Box," when several subjects dealing with items of local interest were brought before the meeting for discussion. The Hon. Secretary (Mr. A. R. Hillos) presented the annual report, and the officers were elected for the forthcoming year.

NETHERTON, August 24th.—Mr. R. Cattle read an interesting paper, "Shortage of Feed for Liva Stock During the Winter Months," and a keen discussion followed.

PARILLA, August 24th.—Mr. A. W. Wilden read an article "Wheat Land Investment: Large Farms v. Small," and an interesting discussion followed, members generally favoring the small farm.

WILKAWATT, August 25th.—The Hon. Secretary (Mr. F. R. Koch) read an article, "Top Dressing of Pastures," and an interesting discussion followed. Members were convinced of the benefits to be derived from the application of manures to grass lands. One member firmly supported the practice of heavy dressing of superphosphate for cereal crops in order that better feed would be obtained for grazing. If the stock carrying capacity of the land was to be increased, forage crops would have to be sown on lands that at present were left for pasture.

WINKLE, August 20th.—The Deputy Horticultural Instructor and Manager of the Berri Orchard (Mr. C. G. Savage) attended the meeting and delivered an address, "Spraying Trees and Vines."

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SOUTH AND HILLS DISTRICT.

IRONBANK (Annual average rainfall, 33in. to 34in.).

August 25th.—Present: four members and two visitors.

RABBIT DESTRUCTION.—Mr. I. Morgan, who read a short paper dealing with this subject, said the rabbit was a pest to be feared by all landowners, and he believed the use of the ferret to be the most profitable method of keeping it under control. He had used ferrets for three afternoons and had taken nearly 60 rabbits, the skins of which realised 26s. Trapping was another good method of dealing with the rabbits, but the trap was expensive, and there was always the danger of the rabbit pulling the trap peg out of the ground and running off with the trap. Poison could be used successfully on farms and grazing properties, but the speaker did not think it would be very effective in their district. Mr. G. Pole mentioned that he had poisoned blackbirds by placing pieces of poisoned quinces under trees and in creeks.

KANGARILLA.

Present: 19 members.

August 10th.—Present: 19 members.

VINE PRUNING.—Mr. F. Steer, in a paper dealing with this subject, stated that prior to the commencement of pruning operations, the secateurs and saw should be sharpened so that clean cutting would result. The correct time to start was when the leaves had fallen, generally commencing on those varieties which start to shed their leaves early in the season. The best time to prune currant vines was about the end of June and the work should be continued on through July. The operator should consider the growth that had been made by each vine during the past year, and if the growth had been coarse, an extra rod should be left, but if the vine had only made poor headway fewer rods should be left. He considered the short spur and medium length rod the best, because the very long rod only grew three or four buds on the end, and having to support too much wood, it was only able to produce grapes of a poor quality. With a spur vine that had made very strong growth, it was better to leave a "thumb and finger" rather than to start another arm. The Muscat and Doradillo varieties should be pruned with very short spurs, and he favored cutting about half way between the buds for the spurs, because he did not think cutting right down to the bud a good practice. The Muscat should be summer pruned, because it produced a number of shoots from blind buds which robbed the growth from the bearing wood. All pruning should be performed with the idea of keeping the centre of the vine open, and running along the wire, so that the vine would not be injured with the plough. Stock should not be allowed in the vineyards whilst the leaves were still on the vines. In the discussion that followed it was mentioned that with early pruning the buds burst more quickly, but there was a grave danger of the young shoots being cut with the frosts, and for that reason members considered it would not be advisable to prune too early. The question arose as to whether the dead wood should be cut out each year when the vine was pruned half way between buds, which gave the bud a stronger hold on the cane. Mr. Steer explained that in the next winter pruning, that all dead wood was cut out below that bud, and a fresh bud was selected to form the top bud. Two buds were left on each spur. Some members thought that one bud was not enough for Doradillos. By summer pruning, the winter pruning was considerably helped. The number of spurs to be left on the rod and spin system was discussed. By leaving seven or eight spurs, members thought, better fruit would be obtained than by leaving 12 or more spurs.

ROOT CROPS AND THEIR VALUE.—Mr. H. B. Michelmores, of the Meadows' Branch, read a paper dealing with this subject at a meeting of the Branch held on August 20th. In the discussion that followed, one member said mangolds could be stored and kept in splendid condition for six months. Mr. Smith advised planting during the latter end of December. The ground should be well worked up to a condition equal to that required for summer potatoes and the seed sown with 2ft. between the rows. The plants needed thinning out, and the land cultivated to conserve moisture. For feeding to milking cows, the mangold was very satisfactory. It could be fed whole or cut in small pieces. Mr. S. Smith stated that maize, fed with the young cobs, was a splendid milk producer.

ROCKWOOD.

August 20th.—Present: 19 members.

CONCRETE FOR FARM BUILDINGS.—"Concrete for farm buildings and floors of cow byres, stables, and pigsties is in my opinion the best material to use," said Mr. G. Solly, in a paper under the above title. Concrete, both from an economical and durable point of view was to be preferred to any other material. The manure that was taken from the sheds sheltering the stock was of a better quality where concrete was used, because all the moisture was conserved and could be carted out with the manure. With sufficient bedding, the concrete floors could be kept in a dry condition, they were easily kept clean, and discouraged the presence of flies. The first step in making a concrete floor was to secure a solid foundation, next the floor should be graded, and all foreign matter removed. The slope on the floor should be in the proportion of $\frac{1}{4}$ in. to 1 ft. For the pigsty, however, he suggested sloping from the back and the front, and making a drain in the centre, thereby draining all waste out of the sty. When the concrete was placed in the sty, two bars of iron should be set in the concrete, to which the trough should be attached, so that the pigs could not capsize their feeding vessel. For making first-class concrete, clean river gravel should, if possible, be obtained. Such material would take one part of cement to six parts of gravel for an ordinary farm floor. The sand and the cement should be first thoroughly mixed in a dry state, and the water then added slowly until the proper constituency was reached. The mixing should be done on a clean floor or on boards. Where clean gravel was used, no finishing mortar would be required. The floor of the cow byres and pigsties should be made with a rough surface to prevent the animals from slipping. Concrete floors should, if possible, be laid down in the winter, because it was necessary to keep the material damp until it became thoroughly set.

ONION GROWING.—In the course of a paper dealing with this subject, Mr. F. Wills said, to grow onions successfully, the ground should be ploughed to a depth of six inches, at least one month before they were planted. The ground should then have artificial or farm yard manure applied to the surface, and then ploughed again and well worked down to a fine tilth. He had found that a good dressing of guano gave better results than higher priced manures, because it acted most readily. That was an important point, because the onion plant should be forced from the time it was planted. If it were checked, a poor crop would be the result. Half a ton per acre was a good dressing, but if the "flooding" method of watering was adopted, a heavier dressing could be made. When the ground had been worked down with the harrows, a strip should be raked with a hand rake, and as one row was planted, another could be raked. That would keep the ground level and allow the plants to be planted at an even depth. The rows should be 10 in. apart, and the plants 4 in. apart in the rows. Planting carried out on those lines would take 200,000 plants to the acre, and should yield 20 tons to the acre. Too much attention could not be given to the selection of seed. If possible, the grower should always grow his own seed, which should be selected when the crop was being picked up for market. Onions selected should be of moderate size, the right shape and color. Color was an important point, especially with the Brown Spanish variety, because they had a tendency to take on a lighter color, which meant that in a few years they would lose their keeping qualities. The best keeping varieties were Brown Spanish and Brown Globe, or James Long Keeper. He favored a cross between the Brown Spanish and Globe, which gave depth to the Brown Spanish, which meant a heavier crop. To grow onion plants, the seed should be sown about the second week in June, and should be ready to plant out for the main crop the first week in October. The onions should be ready to pull about the middle of March, so the crop could be housed before the commencement of the rains, because the rain discolored the onions. The onions should be pulled when the majority of them had "gone down," six rows being placed into one with the tops facing upward to keep the onions from being burned by the sun. They should be left in that position until the necks were thoroughly dry. When picked up they should be run through the hands, all surplus skin and tops removed, and then carted into the shed when sufficiently cool. The onion shed should have plenty of ventilation, the floor being raised off the ground and made of slats placed $\frac{1}{4}$ in. apart. The onions should not be stacked more than 3 in. high or 10 in. wide.

LENSWOOD AND FOREST RANGE.

August 8th.—Average annual rainfall, 35in. to 36in.

Members visited the Government Nursery at Belair for the purposes of securing forest tree seedlings for planting. A trip of inspection was also made to the Government Orchard at Blackwood, where, under the guidance of the manager (Mr. R. Fowler), members inspected the various horticultural experiments that were being conducted.

CROP DIVERSIFICATION.—At a further meeting held on August 20th, a paper on this subject was read by Mr. M. Vickers, in the course of which it was stated that growers in that locality who prided themselves on their ability to produce high-grade apples were foresaking that industry for other lines of produce. At the same time the speaker realised that such a position had been brought about largely through the failure of the apple crop and the necessity for turning attention to other means of deriving a livelihood. The main point, however, was that growers were beginning to grow produce of so diverse a nature as to interfere with the production of high-grade apples on economical lines. In this district it was not an uncommon occurrence to observe a grower neglecting, at a critical stage, thoroughly to spray his orchard, on the plea that no time was available for the work, yet at the same time the grower was devoting his attention to some small crop, which at the best, was more or less a gamble. He believed that the retrogression of the locality, so far as its reputation as an apple growing centre was concerned, was due in a very large measure to too diversified cropping. Most of the apples grown in the district were produced and handled under the same conditions that prevailed ten years ago, whilst other apple growing centres, which now held pride of place, were considerably improved in cultural methods. Such improvements as high-powered spraying outfits, double and three furrowed ploughs, cool stores, &c., greatly facilitated the raising of crops, but whilst being necessary, they could not be owned and operated on small orchards without over capitalising the orchard, so that the obvious remedy was to enlarge the holdings. The aim of the producer should be first to hold from 20 to 30 acres of apples and prunes. Such an area would be a one man proposition, thereby allowing that personal supervision which was so necessary for combating the multitudinous pests which were a contending factor to successful horticulture. Apart from the harvesting of the fruit, one man should be able to perform all the work on a holding of the area mentioned. The system of marketing was not all that could be desired. When a grower who produced some thousands of cases of apples had to travel 20 miles to a market with a few cases and then haggle over the sale of each individual case, there was something wrong with the methods of placing the produce on the market. He, of course, realised that they must to a certain extent rely on "pot boilers," but only those lines that would act as "fillers" among the apple and prune trees should be used until such time as the main portion of the orchard came into profitable bearing. The growing of raspberries, however, might be undertaken in those places that had sheltered spots especially suited for the purpose. He was not particularly optimistic regarding the cultivation of raspberries on a very large scale in this State, especially when one realised that the growers in Tasmania had just had a bumper crop for which they were prepared to accept 2½d. per lb. The huge crop of last year in that State had left a surplus of 500 tons to raspberries to come on to a market with "the bottom already knocked out of it." On the other hand he regarded the prospects of the apple and prune crops as fair. The record crop of apples in Tasmania and Victoria, coupled with the unusually dry summer, was causing enormous quantities of fruit to fail to mature, and that would very materially lessen the quantity available for export during the next year. The paper concluded with a reference to the new variety of prune, "Coates 1418," which would soon be available for planting, and the advantages which it appeared to have over the "Prune D'Agén."

RAPID BAY.

September 1st.—Present: 29 members.

CARE OF THE FRUIT GARDEN.—To those who intended planting an orchard, Mr. S. J. Lord, in the course of a paper dealing with the above subject, suggested that the land should be ploughed and thoroughly worked during the summer months. For that district he favored early August planting. Large holes should

not be made in which to plant the trees, because if there was a clay subsoil, it held the water, which became stagnant and so injured the tree. On the other hand, if the trees did grow, the roots made a rapid growth in the soil immediately surrounding them, but then they came into contact with the clay they were too tender to penetrate it, which caused them to curl and become matted. He had had best results by making a shallow hole, spreading out the roots evenly, and then covering them with fine soil, which should be tightly packed around the roots to keep the tree firm and upright. The soil which was taken out from the bottom of the hole should then be placed on the surface of the ground. The trees should be cut back to about three branches. The trees should be also pruned every year, and the fruit encouraged to grow on the stout limbs. Peach and apple trees should be sprayed with Bordeaux Mixture during August and again when the flowers were setting, to keep curl leaf and codlin moth under control. When the trees had become established, the land should be ploughed in April and then left in a rough condition, so that the furrows would help to drain the soil. Several questions were then brought forward for discussion, the first being, "Is it advisable to milk a cow just prior to calving?" Members were divided in their opinions regarding the best practice to adopt. Some thought the plan advisable, whilst others considered that milking prior to calving would be apt to bring about milk fever. "A remedy for cores inside cows' teats?" Members suggested rubbing olive oil on the teats and udder. "The best time for dipping sheep?" The opinion was unanimously expressed that all sheep should be dipped about one month after shearing.

ASHBOURNE, August 20th.—The meeting took the form of a debate, the subject for the evening being "The Top Dressing of Pasture Lands *versus* No Dressing." After interesting arguments had been brought forward by both teams of delegates, the Chairman decided in favor of the affirmative side, which was ably presented by Messrs. H. R. Meyer and S. Cuming, while Messrs. C. Pitt, K. B. Kirkham, and R. W. Haines supported the negative side of the subject.

CHERRY GARDENS, August 21st.—Mr. G. D. Basey read a paper recently read at the Longwood Branch, "Potato Growing," and an interesting discussion followed.

MILANG, April 14th.—Twenty-two members and two visitors attended the April meeting, when a paper, "Cultivation and Harvesting of Peas" was read by Mr. H. Warner.

A further meeting was held on May 12th, when Mr. W. S. Day contributed a paper, "The Farm and Farm Management," which was read by Mr. A. D. Matheson. An interesting discussion followed the reading of the paper.

MORPHETT VALE, August 23rd.—Mr. A. Furniss read a paper, "Better Utilisation and Land in this District," and an interesting discussion followed.

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MOUNT PLEASANT, August 10th.—After the Hon. Secretary (Mr. W. I. Vigar) had presented the annual report, and the officers had been elected for the ensuing year, members inspected experimental plots in connection with the top dressing of pasture lands that were being carried out by the Hon. R. T. McIrose. Members were considerably impressed with the improvement that was noticeable in the manured plots over those that had not received any fertilizer, which distinctly showed the advantages of top dressing pasture lands in the Mount Pleasant district.

NARRUNG, August 27th.—An interesting address, "Observations on Agricultural Methods Abroad," was delivered by Mr. W. Howie to an attendance of 17 members and two visitors. Other matters of current interest were also brought before the meeting for consideration.

PORT ELLIOT, August 22nd.—The delegates to the Conference of Southern Branches gave a report of the proceedings of the Conference, and an interesting discussion followed. The subjects "Rabbit Destruction," "Sheep Dipping," and "Spraying Fruit Trees" were also brought before the meeting.

RAPID BAY, August 4th.—Mr. G. C. Cant delivered an address, "Depletion of Pasture Lands," and read extracts dealing with the same subject. An interesting discussion followed.

SOUTH-EAST DISTRICT.

ALLANDALE EAST.

August 24th.—Present: 11 members.

TREE PLANTING.—"If every landholder and farmer planted a good number of trees each year they would be doing something to improve the value and appearance of their holdings," said Mr. M. McCabe in a paper dealing with the above subject. Not only did clumps of trees and hedges add to the value of the property, but they provided a much needed shelter for stock. The corners and stony patches of paddocks could be planted with suitable trees, and he also thought it would be a good plan to plant avenues of trees along the main roads, especially those roads that intersected cold and bleak flats. The first care in the planting of the trees was to see that the young plants were protected from stock and vermin. Some weeks before the actual planting of the trees, square holes should be dug in the ground and the subsoil loosened with a crowbar. When planting, the roots of the trees should be puddled in a thick mixture of earth and water, and the roots spread out to the fullest length. If the earth in the centre of hole was made somewhat higher than the outside edges the roots would have a tendency to strike downwards. A damp and dull day should, if possible, be selected for the planting of the trees, and when that work had been completed three pegs should be driven into the ground around the trees and a piece of old bagging tacked on to the pegs to protect the tree from the wind and hail. When fine weather commenced the bagging could be removed. During the first summer, the young trees should be occasionally watered, and when once established the trees would require no further treatment, except to keep the grass and weeds in check. Relating his experiences with the planting of different kinds of trees, Mr. McCabe said Remarkable pines should not be planted within a chain and a half of gardens or buildings. Yate gum had proved a very hardy and rapid growing tree. Wattles could be sown on practically any class of land. Before sowing, boiling water should be poured over the wattle seed, and it should be allowed to remain in the water over night. For hedges he favored the lucerne, cypress, pittosporum, boobialia. Boxthorn made a good breakwind but it should be kept under control, because there was a danger of its spreading and providing a harbor for vermin. In the discussion that followed, Mr. Griffith said he had found stock very fond of tree lucerne. He agreed that pines should not be planted near a house or garden. They robbed other plants of soil moisture and the needles from the trees were a constant source of trouble in the gutters

of the house. He had found the Yate gum and Mountain ti-tree excellent shelter trees. Mr. Kieselbach said the stringybark was a good shelter tree for the stock in summer. Rabbits did not damage the young trees to any appreciable extent, and fire did not have any harmful effects on the older trees. Stringybark trees could be transplanted if one were careful to move the earth with the tree. Mr. Yateman said pepper trees provided good shelter, and the cypress the best hedge. He had found it a good plan to roast wattle seeds in a hot oven before planting. Mr. McCabe said pine trees made good growth on sandy land and that wormwood made a good hedge for calf paddocks. Tree lucerne hedges should be grown from the seed. Transplanting the young plants from a seed plot was not a very successful method of growing the hedge. Mr. Laslett favored wormwood for a hedge. It afforded excellent protection for the garden, was shallow rooted, and did not rob the soil of moisture. Boxthorn and Mountain ti-tree also made good hedges, but the former soon became a nuisance unless kept under control. Mr. Sewart mentioned the revenue that could be derived from the cultivation of wattles and the value of the timber for firewood.

KALANGADOO (Average annual rainfall, 33in. to 34in.).

August 11th.—Present: 13 members.

SOME QUALIFICATIONS OF THE SUCCESSFUL FARMER.—Mr. W. Rogers, who contributed a paper under this heading, said the farmer's calling was one of the most honorable and useful. The more knowledge a farmer possessed the better were his chances of success. It was most essential for a farmer to be not only master of one branch of the business, but of all; therefore, education was most important. By that he did not mean that a man required a college education to be successful as a farmer, but rather to be a good judge of land, and have the ability to determine how to work the various classes of soil on his property. With judicious tillage and discrimination in the uses of fertilisers, and the selection of crops, it was possible to obtain profitable returns from poor land. On the other hand, if such land were not worked on sound lines, it might easily prove ruinous to the person who was depending upon what he could make off it for a living, even though he might have made an honest attempt to gain the best results. Good ploughing was not only pleasing to look at, but was also a factor in successful crop growing. If the land were properly turned with the plough, it made it better for the rest of the farm machines which followed right up to the completion of the harvest. Bad ploughing, which left ridges and hollows, was bad for the plant, because from the ridges too much moisture was evaporated, and in the hollows too much moisture was allowed to remain. There had been great improvements of late years in labor-saving machinery; and the farmer had to study carefully each machine. In dairying, a very important branch of farm work, the farmer required to be skilled, observant, and painstaking. The selection of cows and the breeding of young stock, the feeding and treatment of cows, and handling of the dairy products all required sound judgment and knowledge, and the same also applied to the profitable raising of pigs and poultry. Cleanliness in connection with all dairy work should be observed strictly. It should be the aim of the farmer to keep his land clean and clear of weeds and pests. The farmer also required a fair knowledge of the more common complaints to which stock were subject, and to know how to treat any animals that were sick, because it was not always possible to obtain the assistance of a veterinary surgeon. The farmer, to be successful, should also possess integrity and be industrious. He required to be methodical and to attend to his duties throughout the year, because each month the work on the land varied, and should be done in its turn. If that were done the farmer would get through an immense amount of work with satisfaction to himself and without feeling tired and overworked. On the other hand, if he permitted work to be put aside, he would find that he could not recover lost time, except by rushing and skimping the work. Many farmers disregarded social obligations, but if possible that should be avoided, because a man who practically cut himself off from his fellow men was not a good, nor desirable citizen.

MOORAK.

August 23rd.—Present: eight members.

NOXIOUS WEEDS AND DIRTY FARMS.—Mr. J. P. Mahoney, who read a short paper dealing with this subject, said it was very discouraging for the farmer who used his best endeavors to keep his farm free from troublesome weeds, to see his neighbor making no effort to keep weeds under control. Many of the weeds that were a source of annoyance to the farmers had been introduced into the district with various kinds of seed, and every farmer should be constantly on the lookout to keep under control any new seeds that might make their appearance. Mr. A. Kilaby mentioned that he had found seed wheat badly infested with wild radish. Every farmer should do his share in keeping the weeds under control. Mr. Dickson stated that every year he found fresh weeds making their appearance on his farm. Mr. Barry impressed on members the importance of grading seed prior to sowing, and considered the harvester a bad machine for spreading the seeds of weeds. The Field Officer for the South-East (Mr. E. S. Alcock) said the Noxious Weeds Act was not enforced as strictly as it should be, and because of that fact careless farmers did not trouble to control the spread of weeds on their farms.

TATIARA (Average annual rainfall, 19in.).

August 25th.—Present: 11 members.

CARE OF HARNESS.—In the course of a paper, "Harness, Its Use and Abuse," Mr. A. Milne first referred to the collar. The subject of the prevention of sore shoulders was one that was frequently discussed by farmers, and very often the practice of cutting a hole in the lining and pulling out some of the straw was suggested. He strongly deprecated that practice, because the foundation of the collar was undermined, and it soon lost its shape. Not only that, but the pieces of straw that poked through the hole were a source of constant irritation to the sore on the shoulder of the horse. If the farmer decided to cut the lining, some of the straw should be removed, but the hole should immediately be covered with a piece of basil leather. The speaker was of the opinion that the best preventive of sore shoulders was to see that the horses were properly fed and nourished. If a horse contracted a sore shoulder, the collar should be lined and stuffed with horsehair, but the place covering the sore should not be stuffed, but pulled in and covered with a piece of leather, care being taken to keep the piece of leather thoroughly oiled. Nothing was better for preserving the leather than neatsfoot oil. A good harness dressing could be made by boiling neatsfoot oil and mutton fat to which had been added a little beeswax and fat black. Old harness should be oiled without being washed. The harness should be hung in a dry shed. Four wide pegs should be used for the collars. Collars that were not in constant use should be buckled and placed flat on the rim to keep them in shape. Mr. King expressed a preference for leather-lined collars. Mr. Bond stated that wattle-bark solution was a good cure for sore shoulders. Mr. Daenke suggested the use of oilcloth lining to cover the sore, and washing the collar and shoulder of the horse after work.

KALANGADOO (WOMEN'S), August 11th.—The inaugural meeting of the above Branch was held in the local institute, on Saturday, August 11th. Fourteen members were present. Mr. D. W. Tucker, a member of the Kalangadoo Branch of the Agricultural Bureau, attended the meeting and delivered an address dealing with the work of the Agricultural Bureau. The election of officers took place and it was decided to hold future meetings of the Branch on the second Saturday afternoon of each month.

